

The Trigger Point Therapy Workbook

THIRD EDITION

YOUR SELF-TREATMENT GUIDE FOR PAIN RELIEF

Clair Davies, NCTMB
Amber Davies, CMTPT, LMT

Foreword by David G. Simons, MD,
coauthor of *Travell & Simons'*
Myofascial Pain and Dysfunction:
The Trigger Point Manual

The proven method for overcoming soft-tissue pain,
now available in a practical, step-by-step format

Fibromyalgia • Chronic Myofascial Pain Syndrome • Low Back Pain
Carpal Tunnel Syndrome • Tennis Elbow • Neck and Jaw Pain
Frozen Shoulder Pain • Arthritis • Headaches • Sore Knees and Feet
Accident Trauma • Joint Pain and Muscle Aches
Sports and Repetitive Strain Injury

**Fully Revised
& Updated**

“I have long been a believer in and practitioner of trigger point therapy. I certainly recommend this book to the general public and health care practitioners. It is truly an excellent resource and provides the tools that induce self-healing and empowerment.”

—**Bernie S. Siegel, MD**, author of *Love, Medicine, and Miracles* and *Prescriptions for Living* and former student of Janet Travell, MD, author of *Travell and Simons' Myofascial Pain and Dysfunction: The Trigger Point Manual*

“This is ... a well-organized, easy-to-use handbook that will indeed help sufferers of myofascial pain learn to treat themselves with effective self-massage techniques. The detail and clarity of the book's format will also make it invaluable to pain physicians who want to be able to teach their patients useful, simple strategies to manage soft tissue pain problems.”

—**Joseph F. Audette, MD**, instructor at Harvard Medical School and director of Outpatient Pain Services at Spaulding Rehabilitation Hospital in Medford, MA

“This is a useful book for anyone in chronic pain. There are few resources like this one, which empowers the reader to understand the problem and offers the tools to manage it. The approach to managing pain described in this book will help many take control of a significant part of their health and will become a valuable lifelong reference.”

—**Scott M. Fishman, MD**, chief of the Division of Pain Medicine in the Department of Anesthesiology and Pain Medicine at the University of California, Davis and author of *The War on Pain*

“As a medical doctor who has been challenged by patients experiencing chronic pain, including those suffering from long-standing cases of fibromyalgia, I appreciate a safe solution for their problem. I believe this book, revealing that trigger point therapy may safely relieve chronic pain, should be in the hands of every doctor.”

—**Terry Shepherd Friedmann, MD**, author of *Freedom Through Health*

“Trigger point massage therapy may be the most effective treatment known for a wide variety of pain problems, including fibromyalgia and myofascial pain syndrome.”

—**C. Norman Shealy, MD, PhD**, founding president of the American Holistic Medical Association and author of *The Illustrated Encyclopedia of Healing Remedies*

“This must-have book gives practical methods for dealing with chronic pain in a format that is easy to use, and it works! I'm a believer!”

—**Jo Ann Gillaspay, MS, RN**, editor of *The Nephrology Resource Directory*

“Properly used, the information in the Davies's book should enable many people with myofascial trigger point disorders to participate effectively in treating their conditions. The book should be especially useful to those who do not have ready access to a practitioner familiar with the diagnosis and treatment of these common muscular problems.”

—**Michael D. Reynolds, MD**, rheumatologist

“The Trigger Point Therapy Workbook is a welcome and timely addition to the worlds of personal wellness, pain relief, and self-care. The author creates a highly effective form of pain therapy that anyone can learn. This book is a valuable contribution to the field of self-applied therapeutic bodywork.”

—**Robert K. King**, founder and president of the Chicago School of Massage Therapy

“I have personally benefited from the therapeutic effects of trigger point massage and I believe it deserves official recognition in the medical world. I hope physicians will study these self-treatment techniques and recommend them to their patients.”

—**Rose Marie Hackett, DO**, osteopathic physician and radiologist

“As a chiropractor for twelve years and an instructor of trigger point therapy at the Utah College of Massage Therapy for ten years, I found the Davies’ book very accurate and complete. The graphics and illustrations make it easy to show patients and clients ways to improve quality of life. I believe the book will be a valuable asset to all health care practitioners who use trigger point therapy.”

—**David B. Thomson, DC**, instructor at the Utah College of Massage Therapy

“Professional bodyworkers can use this book to sharpen their skills and to help improve the treatment of their clients. This self-treatment method will enable any motivated person to take personal responsibility for his or her own health to a whole new level.”

—**Stephen Yates, NCTMB**

“This well-written book makes it easy to locate muscles and trigger points. Massage therapists and physical therapists will appreciate the ingenious techniques the author has devised to prevent injury and discomfort to the hands while treating the source of pain.”

—**Ann Luray Hatton**, neuromuscular therapist

“Literally millions of people will be helped—and billions of dollars saved in unnecessary treatments and medications—as people and professionals finally begin to understand the role of muscles, referred pain, and trigger points in eliminating pain. The Davies have provided an important bridge between the many helping professions that deal with people in pain and their patients.”

—**Robert Uppgaard, DDS**, author of *Taking Control of TMJ*

*“Myofascial trigger points have become a primary focus for any clinician addressing musculoskeletal pain complaints. In this third edition of *The Trigger Point Therapy Workbook*, Amber Davies has compiled an excellent resource that covers theoretical concepts and practical applications in a clear and concise manner. The hallmark of any clinical treatment guide is whether or not individuals can easily access information and put it directly into practice for successful outcomes. Ms. Davies provides excellent examples and helpful illustrations woven with clinical experience that make this text a highly valuable resource. It is far from a dry academic text, but in fact is packed with useful information for any clinical practitioner or individual who wants to learn more about effectively treating myofascial pain.”*

—**Whitney Lowe**, director of the Orthopedic Massage Education & Research Institute

"I recommend *The Trigger Point Therapy Workbook* to all of my clients no matter what age or background. It is a powerful tool for anyone who wants relief from muscular pain. Clair and Amber Davies have taken some very complex science and made it user-friendly. With some reading and practice, you'll become your own best therapist."

—**Elliott Bell**, personal trainer and coach

"In this third edition, Amber Davies has taken her father's book, an excellent book in its own right, and done a wonderful job of improving it. She has filled in more of the science and general guidelines of trigger point treatment so that the readers have a better understanding of their conditions. But what I particularly like is the addition of textboxes along the way that help readers to better understand the content as they go along. For anyone who wants to learn how to work on his or her own trigger points, I recommend this book highly."

—**Joseph E. Muscolino, DC**

"Following in her father's footsteps, Amber Davies has prepared a timely update of *The Trigger Point Therapy Workbook*. Not only does this book provide the most comprehensive review of self-treatment strategies, the author has included an excellent update of the current scientific understanding of the causes and mechanisms of trigger points, referred pain, and other important aspects of myofascial pain. Doctors, physical therapists, chiropractors, massage therapists, and other healthcare providers should recommend this book to all their patients suffering from myofascial pain. The methods described in this book can be used for acute, subacute, and chronic pain problems. *The Trigger Point Therapy Workbook* is the book I recommend to my patients!"

—**Jan Dommerholt, PT, DPT, MPS, DAAPM**, president of Bethesda Physiocare®

"Amber Davies has actually done it. She has stood on the shoulders of her father and other luminaries in the world of muscle pain and has produced a reference for the average person. ... This third edition takes on new material and brings the reader up to date with new information combined with easy-to-understand and perform treatment techniques. You will learn about things that might be causing your pain and what to do about it. This is a book I can highly endorse. I know. I keep giving mine away."

—**Richard Finn LMT, CMTPT, MCSTT**, lead instructor and therapist at the Institute of Medical Careers, Pittsburgh, PA

"Amber has continued her father's legacy of delivering information on trigger points in a way that the skilled practitioner and layman alike can understand and apply. This is a must-read for anyone dealing with issues of chronic pain and tension. I will continue to recommend this book to my clients and friends as an owner's manual for rehabilitation and health maintenance."

—**Ann E. Boone, LMT**, trigger point practitioner and instructor in Lexington, KY

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New Harbinger Publications, Inc.

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Distributed in Canada by Raincoast Books

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New Harbinger Publications, Inc.
5674 Shattuck Avenue
Oakland, CA 94609
www.newharbinger.com

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Figure 2.6, "A Knot of Contracted Sarcomeres," and Figure 2.10, "Integrated Hypothesis," from Simons, D.G., J. G Travell, and L. S. Simons, MYOFASCIAL PAIN AND DYSFUNCTION: THE TRIGGER POINT MANUAL. VOL 1, UPPER BODY, 2nd ed. (1999). Copyright © 1999 by Wolters Kluwer. Reprinted with permission.

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Cover design by Amy Shoup; Illustrations by Clair Davies; Additional illustrations by Lynn Shwadchuck in the style of Clair Davies

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Library of Congress Cataloging-in-Publication Data

Davies, Clair.

The trigger point therapy workbook : your self-treatment guide for pain relief / Clair Davies, NCTMB, and Amber Davies, LMT, NCTMB ; foreword by David G. Simons, MD. -- Third edition.

pages cm

Summary: "This new edition of the bestselling Trigger Point Therapy Workbook outlines user-friendly and updated methods of self-massage to help relieve pain. This edition also contains new techniques, drawings, and tips to help readers find and treat trigger points"-- Provided by publisher.

Includes bibliographical references and index.

ISBN 978-1-60882-494-6 (pbk.) -- ISBN 978-1-60882-495-3 (pdf e-book) -- ISBN 978-1-60882-496-0 (epub) 1. Myofascial pain syndromes--Chiropractic treatment--Handbooks, manuals, etc. 2. Acupuncture points--Handbooks, manuals, etc. 3. Pain--Alternative treatment--Handbooks, manuals, etc. 4. Myalgia--Physical therapy--Handbooks, manuals, etc. 5. Fibromyalgia--Handbooks, manuals, etc. 6. Massage--Handbooks, manuals, etc. I. Davies, Amber. II. Title.

RZ265.M8D38 2013

615.8'222--dc23

2013014435

This book is dedicated to my daughter Amber Davies. I could not have written it without her steady faith in me. Her patience, constant encouragement, tactful criticism, and undying enthusiasm for trigger point therapy continually renewed my faith in myself and in the value of this project.

Amber has been my number one disciple. As a longtime sufferer of debilitating chronic pain, she was highly motivated to test and validate every new idea regarding self-treatment. My greatest reward has been in seeing her become relatively pain free and self-reliant due to our combined efforts. Amber has gone on to become a skilled massage therapist and is now devoted to helping bring the benefits of trigger point therapy to others.

—C. D., from the second edition

Dedicated to my Pop.

—Ab

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Foreword to the Second Edition

By David G. Simons, M.D.

Clair Davies possesses a fortunate combination of attributes: he is a skilled practitioner, has good writing skills, and shows a remarkable determination to help relieve mankind of unnecessary suffering. The message of this book is a voice in a wilderness of neglect. Muscle is an orphan organ. No medical specialty claims it. As a consequence, no medical specialty is concerned with promoting funded research into the muscular causes of pain, and medical students and physical therapists rarely receive adequate primary training in how to recognize and treat myofascial trigger points. Fortunately, massage therapists, although rarely well trained medically, are trained in how to find myofascial trigger points and frequently become skilled in their treatment.

Since there is no well-established body of research on this subject, there is no well-recognized etiology. Nevertheless, a credible hypothesis based on solid scientific research is available to serve as a model for further research to clarify the nature of myofascial trigger points. Much research needs to be done on this neglected subject.

It is becoming increasingly clear that nearly all fibromyalgia patients have myofascial trigger points that are contributing significantly to their total pain problem. Some patients are diagnosed as having fibromyalgia when in fact they only have much more treatable multiple trigger points. Inactivation of the trigger points of fibromyalgia patients requires especially delicate and skilled treatment.

Skilled clinicians recognize myofascial trigger points as the most common cause of ubiquitous enigmatic musculoskeletal pain, but finding a truly skilled practitioner can be frustratingly difficult. The guidance in this book can serve practitioners who have yet to understand the nature of their own musculoskeletal pain and can also benefit patients who are unable to find a practitioner adequately skilled in this neglected subject.

There is no substitute for learning how to control your own musculoskeletal pain. Treating myofascial trigger points yourself addresses the *source* of that kind of common pain and is not just a way of temporarily relieving it.

Acknowledgments

I am deeply grateful to my late father, Clair Davies, whose original vision still shines on in this book. He poured all of himself into the first two editions, and I am honored to have the opportunity to build on that work. I am thankful, too, for the many people who supported him along the way.

I am also grateful to my husband, James, and my children, Sophia and Nora, for their love and support, and for giving me the freedom to work on this book. Thank you to Maria and Wayne, my sister and brother-in-law, for having their bright eyes on; to my brother, Clay, for cheering me on; to my gram, Ruth Smith, for listening and giving advice; and to my mother-in-law, Jeanne Melchior, for enthusiasm and child-care help. I am also grateful to my late mother, Jan Lipuma, for her love, acceptance, and gentle guidance.

Thank you to Nancy Fuller for modeling for the new illustrations; to Keen Martin for being the worker bee, the filter, and my friend; to my good friends Rebecca Elliott, Jenny Claire Hoffman, Myra Evans, Faye Houser, and many others for helping me retain my tenuous grip on sanity; and to countless clients for the encouragement and the learning experiences they brought to me. Thank you to my workshop students for helping me to grow as a therapist and teacher.

Special thanks to Judith DeLany, Jan Dommerholt, Stew Wild, Sharon Sauer, Debbie Brodzick, Bjorn and Melady Svae, Rebecca Cohen, Katherine Marmor, and Martha Graziano for offering their professional expertise and helping me to get the content right. Thanks to Bear Decatur and Julie Harper for always being available to share their insights and knowledge. Copy editor Jean Blomquist did an excellent job of gracefully correcting my mistakes and clarifying the mysteries, thank you. My sincere gratitude to Jess O'Brien, acquisitions editor at New Harbinger Publications, for his consistent encouragement, levelheadedness, and guidance. Thank you to everyone at New Harbinger who worked so hard on this project and were so patient with me.

Chapter 1

Why Try Trigger Point Therapy?

Jennifer, twenty-eight, loved to run for her health every day in the fresh morning air, but she's stopped running and hesitates to walk even a short distance because of relentless pain in her knees and heels.

Larry, fifty-two, can think of little else but the constant pain in his back. He struggles to get in and out of bed. His back hurts whether he's sitting, standing, or lying down. The pain makes him hate his job and has ruined his love life.

Melanie, thirty-six, spends her days at a computer keyboard and her nights worrying about her future because of the unremitting pain and numbness in her arms and hands. As a single mother, she has to keep working no matter what.

Jack, forty-five, has shoulder pain that wakes him up at night. He can't raise his arm to comb his hair. Reaching up to scratch his back is impossible. A sudden movement brings a jolt of pain that feels like an electric shock and doubles him over, grimacing and breathless. Is this the start of the inevitable decline into old age and disability?

Howard, twenty-three, is a gifted violin student. After years of hard work under some of the best teachers in the country, he now fears a professional career is out of reach because of constant pain and an unexplained, increasing stiffness in his fingers.

Do you know anyone like Jennifer, Larry, Melanie, Jack, or Howard? They're everywhere—on every job, in every office, in every town. The thing all these people have in common, other than chronic pain, is that they aren't getting the help they need. It's not that they haven't looked. They've gone the rounds. They've seen doctors, had tests, done physical therapy, and filled out insurance forms or—sick at heart—have paid the exorbitant bills themselves.

They've tried chiropractic, acupuncture, magnets, pain diets, and herbal therapy. They take their pain medicine and dutifully do their stretching exercises. Sometimes they feel better for a while, but the pain always comes back. Nothing really seems to get to the bottom of the problem. They fear surgery may be the only solution, despite being told there are no guarantees of success. They're beginning to wonder if anybody really knows anything about pain.

The daily clinical experience of thousands of massage therapists, physical therapists, and physicians strongly indicates that most of our common aches and pains—and many other puzzling physical complaints—are actually caused by *trigger points*, or small

If this describes your own situation or that of someone you care about, this book may provide the help you've been seeking. In it, I propose to give you a sensible explanation of what's wrong and to help you find the real cause of your pain. Even better, I'll show you a hands-on way to get rid of the pain yourself: No pills. No bills. No appointments.

contraction knots, in the muscles of the body. Pain clinic doctors skilled at detecting and treating trigger points have found that they're the primary cause of pain roughly 75 percent of the time and they play at least a part in virtually every pain problem. Even fibromyalgia, which is known to afflict millions of people, is thought in many instances to have its beginning with myofascial pain and trigger points. *Myo* means muscle and *fascia* is the connective tissue that both covers the muscle and is present within the muscle tissue. *Myofascial pain* is pain arising from trigger points in the muscles. Most people who have been diagnosed with fibromyalgia also have myofascial pain syndrome and trigger points, and in some cases have been misdiagnosed. It is not uncommon for myofascial pain to be mistaken for fibromyalgia (Simons, Travell, and Simons 1999; Gerwin 1995; Fishbain et al. 1986).

Trigger points are known to cause headaches, neck and jaw pain, low back pain, the symptoms of carpal tunnel syndrome, and many kinds of joint pain mistakenly ascribed to arthritis, tendinitis, tendinosis, bursitis, or ligament injury. Trigger points cause problems as diverse as earaches, dizziness, nausea, heartburn, false heart pain, heart arrhythmia, tennis elbow, and genital pain. Trigger points can also cause colic in babies and bed-wetting in older children, and may be a contributing cause of scoliosis. They are a cause of sinus pain and congestion. They may play a part in chronic fatigue and lowered resistance to infection. And because trigger points can be responsible for long-term pain and disability that seem to have no means of relief, they can contribute to depression.

The problems that trigger points cause can be surprisingly easy to fix; in fact, most people can do it themselves, if they have the right information. That's good, because the time has come for ordinary people to take things into their own hands. Why? Because an appallingly high percentage of doctors and other practitioners are still pretty much out of the loop regarding trigger points, despite their having been written about in medical journals for over seventy years. Why has the medical profession not embraced the idea of trigger points? Partly because they can't be seen by MRI, X-ray, or CT scan. They can't be observed in the cadaver lab either. However, there is an even more basic reason. There are not doctors of muscle backed by large learning and research institutions doing the studies into the muscular causes of pain. You can't go to school to be a doctor of muscle. The largest organ in the body is an orphan. As physician and researcher Dr. David Simons writes in the foreword to this book, "Muscle is an orphan organ. No medical specialty claims it. As a consequence, no medical specialty is concerned with promoting funded research into the muscular causes of pain, and medical students and physical therapists rarely receive adequate primary training in how to recognize and treat myofascial trigger points."

In fact, there are many things yet to be learned about muscles, fascia, nerves, trigger points, and referred pain.

"Muscle is an orphan organ. No medical specialty claims it. As a consequence, no medical specialty is concerned with promoting funded research into the muscular causes of pain, and medical students and physical therapists rarely receive adequate primary training in how to recognize and treat myofascial trigger points."

But there are many things we *do* know: trigger points are real. They can be felt with the fingers. They emit distinctive electrical signals that can be measured by sensitive electronic equipment. Trigger points have been photographed in live muscle tissue with the aid of the electron microscope (Simons, Travell, and Simons 1999). Trigger points can also be seen by 2D grayscale ultrasound, vibration sonoclastography, and Doppler ultrasound (Sikdar et al. 2009). The biochemical environment of active and latent trigger points has been sampled with novel microdialysis needles. The levels of biochemicals known to be involved with pain, sensation, intracellular communication, and inflammation have been measured to identify the characteristics of trigger points versus normal tissue. (Shah and Gilliams 2008).

Much of what is known about trigger points is very well documented in the two-volume medical text *Myofascial Pain and Dysfunction: The Trigger Point Manual* by Janet Travell, MD, and David Simons, MD. Most of the information in this foundational text is couched in difficult scientific terms, but basic trigger point science isn't hard to grasp if it's put into everyday language.

Travell and Simons describe a trigger point as simply a small contracture knot in muscle tissue. It often feels denser or tighter than the surrounding muscle tissue. Often you can feel only a taut guitar-like string in the muscle fiber harboring the trigger point. The constant tension in the fibers of the trigger point itself restricts circulation of blood in its immediate area. The resulting accumulation of the by-products of metabolism, as well as deprivation of the oxygen and nutrients needed for metabolism, can perpetuate trigger points for months or even years unless

some intervention occurs. It's this self-sustaining vicious cycle that needs to be broken (Simons, Travell, and Simons 1999; McParland and Simons 2011).

The difficulty in treating trigger points is that they typically send pain to some other site. Most pain treatment is based on the assumption that the cause of pain will be found at the site of the pain. However, trigger points almost always send their pain elsewhere. This referred pain is what has always thrown everybody off. According to Travell and Simons, conventional treatments for pain so often fail because they focus on the pain itself, treating the site of the pain while overlooking and failing to treat the cause, which may be some distance away.

Even worse than routinely treating the site of the pain is the pharmaceutical treatment of the whole body for what is usually a local problem. Pain-killing drugs, the increasingly expensive treatment of choice these days, give us the illusion that something good is happening, when in reality they only mask the problem. Most common pain, like headaches, muscle aches, and joint pain, is a warning—a protective response to muscle overuse or trauma. Pain tells you that something is wrong and needs attention. It's not good medicine to kill the messenger and ignore the message. When pain is seen in its true role as the messenger and not the affliction itself, treatment can be directed to the cause of pain.

The misdiagnosis of pain is the most important issue taken up by Travell and Simons. Referred pain from trigger points mimics the symptoms of a very long list of common maladies, but physicians rarely get any education in the pathology and dysfunction of muscle. Doctors Travell and Simons believed that most of common everyday pain is caused by myofascial trigger points and that ignorance of that basic concept could inevitably lead to false diagnoses and the ultimate failure to deal effectively with pain (Simons, Travell, and Simons 1999).

Luckily, referred pain is now known to occur in predictable patterns. The valuable medical advance made by Travell and Simons and their brilliant illustrator, Barbara Cummings, has been in delineating these very patterns. Once you know where to look, trigger points are easily located by touch and deactivated by any of several methods.

Unfortunately, the two clinically oriented methods—spray, and stretch and injection—put forth in *Myofascial Pain and Dysfunction*, do not lend themselves to self-treatment. The goal of this book is to build on the work of Travell and Simons and provide a more practical and cost-effective approach to pain therapy: a classic do-it-yourself approach rather than a reliance on multiple professional office visits. This new approach is a system of self-applied massage directed specifically at trigger points. Significant relief of symptoms often comes in just minutes. Most problems can be eliminated within three to ten days. Even long-standing chronic conditions can be cleared up in as little as six weeks. Results may be longer in coming for those who suffer from fibromyalgia, or widespread myofascial pain syndrome, but even they can experience continuing progress and can have genuine hope of significant improvement in their condition.

Trigger point massage works by accomplishing three things: it breaks into the chemical and neurological feedback loop that maintains the muscle contraction; it increases circulation that has been restricted by the contracted tissue; and it directly stretches the trigger point's knotted muscle fibers. The illustrations in this book show you how to find the trigger points that generate your specific problems as well as the exact hands-on techniques for deactivating them. Special attention has been given to designing methods of massage that do no damage to hands that may already be in trouble from overuse.

Self-applied massage has multiple added benefits. If you treat your own pain, you are in control of when, where, and how much treatment you receive. If pain awakens you at night, there you are; you might as well get to work resolving the problem. With self-applied massage, you have control over intensity of the pressure. This is especially important if you can tolerate only a light amount of pressure. Best of all, with self-care, you can benefit from multiple daily treatments wherever you are—without appointments, expensive equipment, or time off from work.

This book is primarily designed for use as a self-instruction manual, but it can also be used as a textbook for classroom use. This simplified and direct approach to treating pain with self-applied massage can constitute a foundational course in trigger point therapy in any professional training curriculum. Students in chiropractic colleges, physical therapy

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With self-care, you can benefit from multiple daily treatments wherever you are—without appointments, expensive equipment, or time off from work.

departments, and massage schools will derive particular benefit. Chapter 11, Clinical Trigger Point Massage, is designed to help the professional manual therapist adapt the book's technical content to the treatment of others. Additionally, if therapists can learn how to interpret their own referred pain and how to find and treat their own trigger points, they will know exactly what to do when they encounter similar problems in their clients or patients.

A class in self-applied trigger point massage would be a boon in medical schools for exactly the same reasons. When new doctors can learn how to fix their own pain with self-applied massage, they are in better touch with the realities of pain and with the great potential in the treatment of trigger points. Such an addition to medical education would profoundly improve the treatment of pain and significantly lower its cost.

And it's not too late for physicians already in practice to learn about trigger points and myofascial pain and to put the knowledge to good use. They will find this book to be a quick and practical introduction to the magnificent work of Travell and Simons and this neglected branch of medicine. Hopefully, many will be encouraged to go to Travell and Simons' two-volume work, *Myofascial Pain and Dysfunction: The Trigger Point Manual* (1983, 1992); *Myofascial Trigger Points: Pathophysiology and Evidence-Informed Diagnosis and Management* (2011), edited by Jan Dommerholt and Peter Huijbrecht; and *Muscle Pain: Understanding the Mechanism* (2010) and *Muscle Pain: Diagnosis and Treatment* (2010), both edited by Siegfried Mense and Robert D. Gerwin. Several journals, including the *Journal of Bodywork and Movement Therapies*, *Journal of Manual and Manipulative Therapy*, *Journal of Musculoskeletal Pain*, *Pain*, and *Archives of Physical Medicine and Rehabilitation*, publish studies concerning myofascial pain. See the Resources section at the back of this book for a list of course providers for medical and allied health professionals. A large segment of the public needs help and encouragement in learning how to deal with their trigger point-induced pain. No one is better positioned to provide this help than members of the medical community.

The members of the medical profession are not unaware of the deficiencies of current methods of treating pain. Doctors hurt, too. Many of them worry like the rest of us about the relentless popping of pills, and many experience frustration with their inability to offer better solutions to their patients. Trigger point therapy, whether self-applied or administered by a professional, has the potential to truly revolutionize pain treatment throughout the world.

A New Day

A doctor should have written this book. It should've been written by a bona fide, credentialed expert in a white coat with years and years of experience and scores of articles published in medical journals. Instead, it took a regular working man—my father, Clair Davies—frustrated by the current medical approach to pain.

In the first two editions of *The Trigger Point Therapy Workbook*, my father told the story of how he came to be a trigger point enthusiast, massage therapist, and author. In short, he was motivated by pain. He had suffered a frozen shoulder in the mid-1990s that disabled him for eight months. It started as a slightly achy shoulder after shoveling snow. Eventually, he couldn't raise his arm above shoulder level, reach across his body to put on his seat belt, open a jar, or reach out to catch a closing door. One doctor diagnosed him with bursitis and recommended that he wear his arm in a sling for six months. As a self-employed piano rebuilder, that was not an option. A second doctor diagnosed it as adhesive capsulitis. His prescription was to put Dad under anesthetic then forcibly manipulate the shoulder to break up adhesions in the joint capsule. My father thought both ideas were nutty and opted for physical therapy. After a round of treatment that worsened his condition, he learned that the physical therapist was also suffering from a frozen shoulder. Her treatment couldn't fix her and it couldn't fix him. Nonetheless, she expected payment. Needless to say, Dad was a little irritated. Later, he tried massage therapy, where he observed the therapist using the medical textbook on trigger points to try to solve his shoulder pain. My father saw an opportunity to take control over his treatment, and leapt at it. He purchased the books by Travell and Simons and got to work.

His story is extraordinary in that he cured his own frozen shoulder with a simple tennis ball, a Thera Cane, and Travell and Simons's two-volume *Myofascial Pain and Dysfunction: The Trigger Point Manual*. It took four weeks of diligent study and treatment for all of the trigger points to be released in the twenty-three affected muscles. After

the trigger points were gone, another two weeks of stretching assigned to him by the original physical therapist restored his complete range of motion. He was astonished. He had solved his own shoulder pain!

Then he came after me. I had lived with chronic low back pain since a lifting injury during a scene change in a regional theater at age eighteen. For six years, I lived with pain. I couldn't sit for more than about an hour without having to jam my knuckles into my low back. I couldn't lift more than twenty-five pounds without paying for it for three days. I couldn't trust my back to do the normal things young people take for granted. Massage therapy and, more specifically, regular self-treatment changed all of that for me. I looked up one day after sitting making jewelry for four hours and realized that I didn't have pain anymore. When I should have been at my worst, I wasn't. My old friend, pain, had vanished; my body was restored. That old pain reappeared one more time a couple months later, and I made a classic self-treatment mistake, I smashed into the trigger points with a vengeance. Luckily, my body was able to accommodate the aggressive self-treatment with nothing more than a couple of bruises. I've had many bouts with other pain conditions through the years, and nearly everything has been resolved with self-applied trigger point massage.

My father and I both attended massage school and became massage therapists with a self-taught specialty in myofascial trigger points. After the publication of the first edition of *The Trigger Point Therapy Workbook* in 2001, we traveled throughout the United States teaching weekend continuing education seminars to massage therapists and any other health care professional who would listen. We reached several hundred therapists in those two and a half years. My father was a lone wolf in many ways and collaboration was a challenge for him. When I became ready to equal my mentor, the time came for us to break up our "Davies and daughter" enterprise and resume being daddy and daughter. I have continued the seminar business, providing workshops for professional therapists as well as regular folks in pain. You can find more information on my website at www.TriggerPointBook.com.

Many manual therapists now treat trigger points. It is not as difficult to find a capable therapist who can assist you in your quest for pain relief. But you don't have to wait. You can begin today with self-applied massage. Start with the Pain and Other Symptoms Guides at the beginning of chapters 4 through 10. They will show you where to begin your search for trigger points that cause your pain. Many muscles and trigger points may be involved. Read chapter 3, Treatment Guidelines, to better understand how to most effectively do the massage technique. I encourage you to carefully read about each muscle that may be contributing to your pain. Above all, don't be afraid to try it. Significant relief can be just around the corner.

The next chapter, All About Trigger Points, describes a little history and science of myofascial trigger points. If you need immediate help without a deeper scientific understanding, skip to chapter 3, Treatment Guidelines.

Chapter 2

All About Trigger Points

In the four introductory chapters of *Myofascial Pain and Dysfunction: The Trigger Point Manual* (1999), Travell and Simons give a detailed presentation of much of what is known about the science of trigger points and referred pain. They substantiate their assertions with references to several hundred scientific articles that pertain to the subject. The personal authority of Janet Travell and David Simons is impressive in itself.

Janet G. Travell, MD (1901–1997)

Janet Travell trained as a cardiologist and pharmacologist in a time when few women were accepted into medical school. A journey with her own shoulder pain led her to explore myofascial pain treatment with her heart patients in New York City. Among those who study myofascial pain, Janet Travell is generally recognized as the leading pioneer in diagnosis and treatment. It was not a solo performance, of course. True innovation is seldom the product of a single mind. It's more often a matter of recombining bits and pieces of previous knowledge to solve a new problem. Dr. Travell read widely, looking for anything she could glean from the work of other people that might address her interests. She discovered that many researchers around the world were beginning to tentatively explore the strange phenomenon of referred pain from trigger areas in muscles. However, they all seemed to be working in isolation and largely unaware of one another's thinking. With extraordinary tenacity and persistence, she devoted herself to bringing it all together.

At the time the first volume of her book, *Myofascial Pain and Dysfunction: The Trigger Point Manual*, went to press in 1983, she had been studying and treating trigger points and referred pain for over forty years. She had already published more than forty articles about her research in medical journals, the first appearing in 1942. Her revolutionary concepts about pain have improved the lives of millions of people. The innovative clinical techniques for the treatment of myofascial pain used by physicians, physical therapists, and other health providers all over the world wouldn't have existed without Dr. Travell's dedication, energy, and intelligence.

Dr. Travell's personal success with one particular patient had a far-reaching effect on history. Not many people remember that Janet Travell was the White House physician during the Kennedy and Johnson administrations. President Kennedy honored her with that position in gratitude for her treatment of the debilitating myofascial pain and other ailments that had threatened to prematurely end his political career. It's a stunning example of how trigger point therapy can change someone's life and destiny.

Although she was in her sixties at the end of her duties at the White House, Dr. Travell had no intention of retiring or even slowing down. She went on developing and teaching her methods with vigor and enthusiasm for the next thirty years. She was past eighty when the first volume of *Myofascial Pain and Dysfunction: The Trigger Point Manual* was published and past ninety when the second volume appeared. She refused to rush into print: she wanted to get it right.

On August 1, 1997, Janet Travell died at the age of ninety-five. She's buried alongside her father, mother, and husband, John Powell, in the Albany Rural Cemetery outside Albany, New York. Her simple gravestone bears her married name, Janet Graeme Powell, with no indication of her professional name, her accomplishments, or her place in history. Perhaps her legacy is more fittingly inscribed in the minds and hearts of those to whom she brought enlightenment and respite from pain.

David G. Simons, MD (1922–2010)

David Simons lends authority to the study of myofascial pain with his long experience as a research scientist. In his early career, Dr. Simons worked as an aerospace physician, developing improved methods of measuring physiological responses to the stress of weightlessness. He was part of the team of researchers who sent animals into space in advance of sending human beings. A fascinating sidelight to his career is the world altitude record for manned balloon flight he set in 1957 as a young Air Force flight surgeon. In fact, he beat Sputnik into space. He was the first human to confirm visually that Earth is indeed round. He was featured on the cover of *Life* magazine that year and subsequently wrote a book, *Man High* (1960), about his adventure.

David Simons first met Janet Travell in 1963, while she was still White House physician. She had traveled to the School of Aerospace Medicine at Brooks Air Force Base, in San Antonio, Texas, to give a program about trigger points and myofascial pain. In 1965, Dr. Simons retired from the Air Force to become the director of research in what is now the Department of Veterans Affairs. That same year he began a long, informal apprenticeship in pain medicine, under the wing of Dr. Travell. A remarkable synergy developed between the two during the next two decades, culminating at last in the production of *Myofascial Pain and Dysfunction: The Trigger Point Manual* (1983, 1992, 1999), a testament to the transcendent power generated when two minds of uncommon intelligence work together.

Dr. Simons's strict attention to detail and adherence to scientific method helped him bring rigorous objectivity to the documentation of myofascial pain. He was the driving force in getting the manual written, doing most of the actual writing himself, with Dr. Travell's vast knowledge and experience as his primary resource.

David Simons died April 5, 2010, at the age of eighty-seven. He continued to be active in the field of myofascial pain until the end. He published articles, reviewed new research, and asked insightful questions of the countless clinicians and researchers all over the world who were studying and expanding the understanding of myofascial trigger points. The David G. Simons Academy, in Winterthur, Switzerland, is one of several institutions in Europe instructing physicians and physical therapists about myofascial pain.

The Trigger Point Manual

Four very lengthy chapters of *Myofascial Pain and Dysfunction* are devoted to the science of trigger points and myofascial pain. Those first four chapters alone would make up a sizable and very technical book. The object here is to take that material, incorporate new research, and make it more accessible to the average reader.

Trigger Points as Scourge

Dr. Travell said trigger points were, without exaggeration, the “scourge of mankind.” Pain from trigger points can be just as harsh as pain caused by a heart attack, kidney stone, or a broken bone. Also, pain from a very small muscle can be as bad as or worse than pain from a large muscle. Trigger points rarely constitute a risk to life, but

the misery they cause can be extremely demoralizing and devastating to quality of life (Simons, Travell, and Simons 1999).

Pervasiveness of Trigger Points

Trigger points are an extremely common natural phenomenon. It's difficult to imagine anyone escaping them or being in any way immune to them. In most people, trigger points are present somewhere in their musculature, at least in a latent state.

Since trigger points are found in muscle tissue, they have a very large territory for creating mischief. Muscle is the bulkiest organ in the body, making up an average of about 42 to 47 percent of body weight. Doctors who specialize in the treatment of myofascial pain have found that muscle pain contributes to pain 75 percent of the time. Trigger points nearly always contribute to pain problems, even when the pain results from disease or trauma. Muscle pain may be the biggest cause of disability and loss of time in any workplace or office, in any professional or amateur sport, or in day-to-day life (Simons, Travell, and Simons 1999; Mense and Gerwin 2010).

One of the difficulties in diagnosing and treating trigger points is that their symptoms can mimic many other conditions. Trigger points are known to contribute to headaches, neck and jaw pain, low back pain, the symptoms of carpal tunnel syndrome, and sometimes to the many kinds of joint pain, including arthritis, tendinitis, bursitis, or ligament injury.

An underestimated trait of trigger points is that they can exist indefinitely in a latent state. You may not suspect that you have latent trigger points because they aren't actively causing perceivable symptoms. They are very easy to find, however, because they hurt when you press them. Many different stimuli can quickly turn latent trigger points into active trigger points that cause spontaneous pain.

Medical Neglect

Despite the importance of muscles as a primary source of common pain, medical students are taught very little about them, even as part of human anatomy. There is no medical specialty devoted to the diagnosis and treatment of muscle disease. In the practice of medicine, attention is directed instead to the joints, bones, bursae, blood vessels, and nerves. This misplaced attention causes a great deal of misdiagnosis and inappropriate treatment (Simons, Travell, and Simons 1999). Research funding is directed toward pharmaceuticals, medical devices, and medical procedures instead of toward less profitable manual therapy. The most logical avenue for treatment, physical therapy, also lacks adequate training courses in clinical pain mechanisms and pain management strategies (Dommerholt 2011).

Many skeptics cite the lack of research into trigger points, but their views are now outdated. The research is in. Trigger points are real, and their biochemistry can be sampled with specialized needles and visualized by scientifically proven methods (Shah and Gilliams 2008; Sikdar et al. 2009).

What Is a Trigger Point?

Considering the overwhelming importance and pervasiveness of myofascial trigger points, it's incredible that they've remained a mystery as long as they have. The term "trigger point" is still largely unknown to the general public, and you won't find "trigger point" in general dictionaries. Medical dictionaries and other medical references are finally beginning to give trigger points some recognition, but usually no more than a sparse paragraph or two at best. The good news is that among pain physicians who are members of the American Pain Society, there is overwhelming support for the concept of trigger points (Harden et al. 2000).

According to Travell and Simons, a *trigger point* is “a hyperirritable spot in skeletal muscle that is associated with a hypersensitive palpable nodule in a taut band. This spot is painful on compression and can give rise to characteristic referred pain, referred tenderness, motor dysfunction, and autonomic phenomena” (Simons, Travell, and Simons 1999). Translated, that means a trigger point is a grumpy little spot in a taut band of muscle tissue that hurts when you press on it. With pressure, it can reproduce and confirm your symptoms.

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A taut band, which is easier to detect by palpation than a trigger point, has been described as feeling like a little piece of partially cooked spaghetti deep in the muscle. You need a good sense of touch to feel a trigger point nodule within this taut band, and not everyone has that ability. Dr. Simons explained it clearly

when he said, “You shouldn’t get too caught up in a search for clearly distinguishable lumps in your muscles. It’s better to think in terms of tiny individual and indiscernible sarcomeres [the structures in muscle that contract] that are in a static state of contracture. A clearly defined nodule (a trigger point or knot) would be a fairly compact cluster of these troubled sarcomeres. In actuality, this cluster of sarcomeres is often spread a little more loosely over an area as large as a nickel or a fifty-cent piece [the latter is found more rarely]. This kind of spot in the muscle could feel somewhat denser, but not necessarily ‘knot-like.’ In this case, you’d want to think of a trigger point as a trigger ‘area’ and the defining characteristic would be the spot’s tenderness, not that you could necessarily feel an actual ‘knot’” (Simons, personal communication with Clair Davies, 2006).

It helps to know that trigger points form in specific places, where the motor nerve comes into the muscle to tell the muscle to do its job. This location is not always tender. It hurts only when a trigger point is present, and then only when pressed on. So, when practicing self-applied trigger point massage, you don’t have to go by what your fingers palpate—feel for the place that hurts.

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The palpable *taut band* is a taut strand of fibers in the muscle that feels like a cord or small cable and forms subsequent to the trigger point (figure 2.1). It extends from the trigger point in both directions and can be mistaken for a small tendon. A taut band can be the most troublesome part of the problem because it restricts range of motion by limiting the muscle’s ability to lengthen. The taut band is often palpable even when the trigger point is not.

It’s important to grasp that a trigger point is not a muscle spasm, although you will sometimes see them described as such, even in medical literature. A spasm is a sudden, hard contraction of the entire muscle. A trigger point and its associated taut band are a *contracture* of only a small area within the muscle. Trigger points can induce a whole muscle spasm, but a trigger point and a spasm are not the same thing.

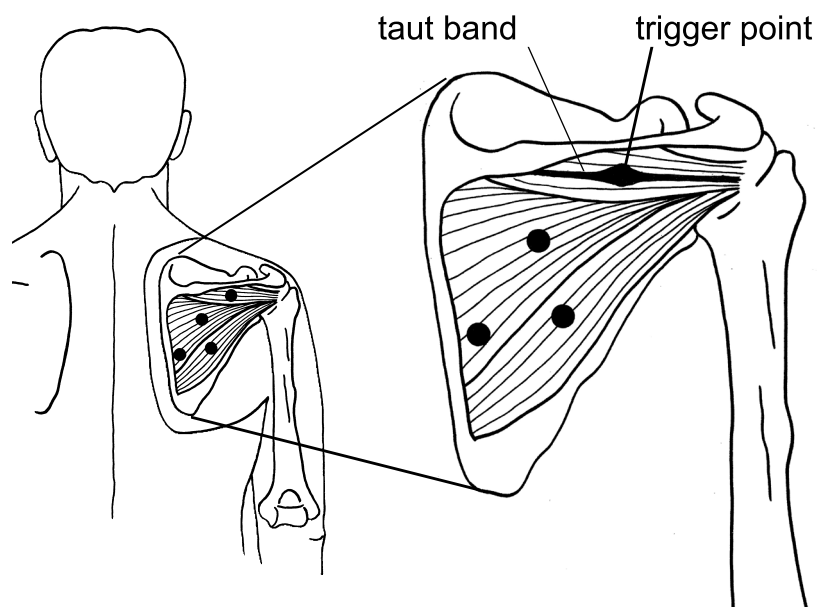


Figure 2.1 Infraspinatus muscle, showing an enlarged view of a trigger point and its associated taut band of muscle fibers. All the black dots are trigger points.

Facial or Fascial?

When people first hear about myofascial trigger points, they sometimes think they cause pain only in the face, getting “fascial” mixed up with “facial.” Trigger points certainly can cause face pain, but myofascial pain can occur anywhere in the body. The prefix “myo” in myofascial refers to muscle. “Fascial” refers to *fascia*, the connective tissue that envelops and separates muscles like shrink-wrap. A superficial layer of fascia covers the entire body just under the skin and houses fat, nerves, blood vessels, and other connective tissue. Deep fascia surrounds whole muscles, muscle sections (or heads), fibers, and even individual muscle cells. (A good place to see superficial fascia is on a raw chicken leg, after the skin has been removed.) Fascia can get tight and thickened and become part of the problem.

Trigger Points and Other Points: Are They the Same Thing?

Janet Travell and others originally used the term “trigger area” to denote what was later called a trigger point (Edeiken and Wolferth 1936). The earlier term did make sense because the trouble spot was often buried so deeply in the muscle that its boundaries couldn’t be clearly detected. When you’re trying to find a trigger point, it sometimes does seem more like a small area than a point.

Acupuncture Points

Acupuncture is a method of treating disease, dysfunction, stress, and pain that is over four thousand years old. There are hundreds of acupuncture points, some of which are on the body’s twelve energy meridians and many others that are not. Acupuncturists use what are called *ah shi* points (or, as translated, “That’s it!” points) to treat musculoskeletal pain and dysfunction. Leading researchers disagree about whether these points coincide with the trigger points studied and documented in *Myofascial Pain and Dysfunction* (Dorsher 2006; Birch 2003, 2008). It is known that needling trigger points and *ah shi* points is an effective way of relieving pain. Many practitioners from various disciplines use needles, solid filament, and syringes to treat what we call trigger points. It is a mistake, though, to assume that acupuncture is the same thing as trigger point therapy. Acupuncture can deal with the body from a much broader and different perspective than, say, a Western-trained manual therapist. The bottom line is if you are looking for a practitioner who treats trigger points, look for someone who has a diversity of training that includes studying the referred pain patterns documented in the work of Janet Travell and David Simons.

Pressure Points

People often say “pressure points” when they can’t remember “trigger points.” This confusion is understandable because you do press on both. But a *pressure point*, or *pulse point*, is the place over an artery that you press to stop the flow of blood from a wound. Pressure points and trigger points can be close to one another, but they are in no way the same thing. The term “pressure point” is also used in shiatsu and reflexology, but it does not mean the same thing as “trigger point.”

Martial Arts Points

Pressure points are used in the martial arts, too. In this case, they're obviously not used for therapy, although after a session of deadly pressure point fighting you may feel the need for treatment of some kind. Practitioners of martial arts systems such as karate, kung fu, tae kwon do, and jujitsu develop skill in striking their opponent's pressure points for the purpose of self-defense. In pressure point fighting, a blow delivered to an opponent's most vulnerable places can impose several moments of severe, immobilizing pain, leaving the striker free to make a quick escape or to disable the opponent further with other techniques.

Fibromyalgia Tender Points

Trigger points are often mixed up with the term “tender points,” one of the original criteria developed by the American College of Rheumatology for identifying fibromyalgia. There are eighteen designated areas selected for palpation of tender points, nine on each side of the body (figure 2.2). Previously, in order to qualify for a diagnosis of fibromyalgia, a person needed to have at least eleven of these points for three months and must have tender points in all four quadrants of the body. These standards were established in 1990 by the American College of Rheumatology (ACR).

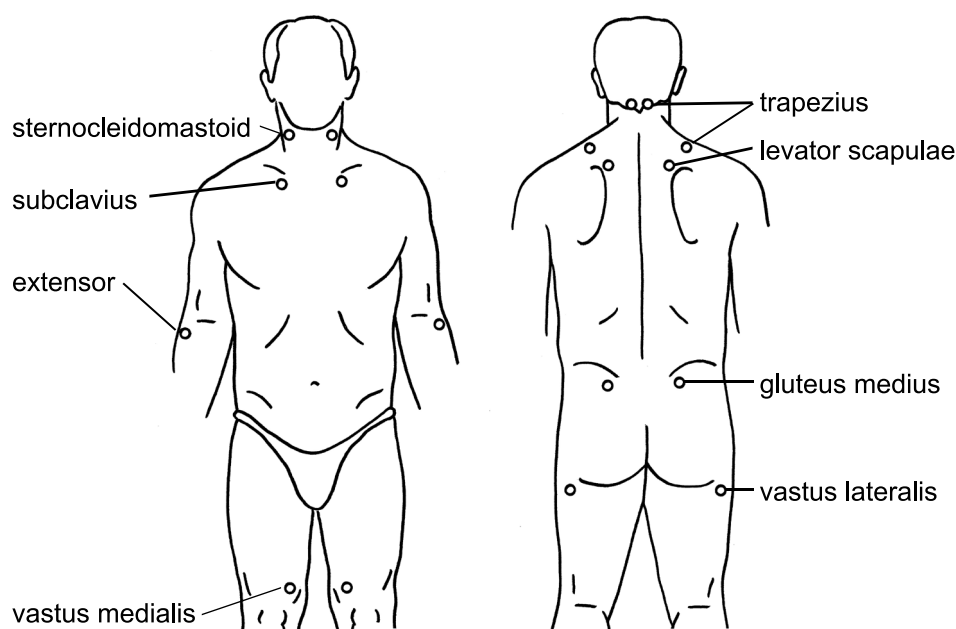


Figure 2.2 Fibromyalgia's eighteen tender points.

A new criterion has been provisionally approved by the ACR that minimizes the use of tender points in the diagnosis of fibromyalgia. According to the May 2010 study published in *Arthritis Care and Research* by Wolfe and colleagues, “[T]he most important diagnostic variables [in diagnosing fibromyalgia in this study] were the widespread pain index [a measure of the number of painful body regions], and categorical scales for cognitive symptoms, unrefreshed sleep, fatigue and number of somatic symptoms” (600). The categorical scales were added up to create a symptoms severity scale. This means that fibromyalgia is characterized by symptoms such as moderate to severe widespread body pain, cogni-

tive difficulties, nonrestorative sleep, fatigue, and other physical symptoms, not just by the tender points. One of the problems with diagnosing fibromyalgia using the arbitrarily selected tender points is that some of the eighteen tender points coincide with or are near the locations of myofascial trigger points (Ge et al. 2010). Many fibromyalgia sufferers have myofascial pain and trigger points that also contribute to their symptoms. It may be that fibromyalgia tender points are symptoms of an overreaction of the central nervous system. Or it could be that they are really hyperactive trigger points contributing to the overstimulation of the central nervous system.

One conclusion that can be drawn from the current research is that fibromyalgia sufferers and therapists should treat trigger points conservatively to reduce myofascial pain. Limit the intensity and duration of treatment based on what can be comfortably tolerated without worsening the symptoms. Sharon Sauer, certified myofascial trigger point therapist and licensed massage therapist at the MYO Pain Relief Center in Chicago, is an expert in helping people who have been diagnosed with fibromyalgia to have a full recovery. In 2000, Sauer developed the Paragon Clinic and the Fibromyalgia Treatment Centers of America to focus on helping fibromyalgia syndrome sufferers. After a thorough myofascial evaluation and correction of underlying perpetuating factors, Sauer starts them at home desensitizing hypersensitive tissues by applying light brushing over the trigger point and referred pain area with a soft bath brush while in a warm shower. This soft scratching is done while gently lengthening the muscle under the warm water. Eventually, when light massage can be tolerated, Sauer suggests beginning with very gentle feather-light pressure on the trigger points followed by feather-light massage. “A thorough myofascial trigger point evaluation, specific self-care training, self-treatment, stretching, moving, and correcting underlying perpetuating factors are a very important part of overcoming the pain and sensitivity of fibromyalgia thus putting them on the road to a full recovery.” (Sauer, personal communication with author, 2012)

The Physiology of a Trigger Point

Research into the physical and chemical makeup of trigger points, as well as their locations, symptoms, and causes, continues around the world. New research articles continue to be published. This section is an overview of some of what is known today about trigger points. For practical purposes, however, all that the average person really needs to know is that trigger points are extremely sore spots in muscles that send pain to other places. With this uncomplicated idea in mind and trigger point charts in hand, a dedicated individual usually has no trouble finding and successfully treating trigger points.

But if you’re interested in knowing more about the most recent scientific research on trigger points, keep reading as we explore some of the most recent findings. Also, if you have a particular interest in this evolving branch of science, keep an eye on the websites www.myopainseminars.com and www.dgs.eu.com.

Scientific Evidence of Trigger Points

Scientists research trigger points in a variety of ways. Technological advances have made it possible to monitor the electrical and biochemical activity of trigger points as well to actually see them. For example, high-frequency, spontaneous, low-amplitude electrical activity, known as *spontaneous electrical activity* (SEA), has been detected in active trigger points and their taut bands with electromyography (EMG). SEA is thought to be associated with the motor endplate of a muscle; the motor endplate is where the motor nerve communicates with the muscle. David Simons dubbed this phenomenon “endplate noise.” It was once thought that motor endplates were found only at the midpoint of muscle fibers, but now it is recognized that motor endplate zones are more widely distributed through the muscle (Mense and Gerwin 2010). A number of other things are revealed by studying these electrical signals. The precise location of a trigger point can be determined. It has also been found that pressing on a trigger point increases its electrical activity. Stretching a muscle too quickly does the same thing by increasing the release of the contraction chemical acetylcholine (Dommerholt, Bron, and Franssen 2011). There is also a minute measurable temperature difference at the motor endplate zone due to increased metabolic activity (Simons, Travell, and Simons 1999).

Being soft tissue, trigger points can’t be seen on X-rays, but their taut bands can be detected using magnetic resonance elastography (MRE), and new research shows trigger points can be seen with color Doppler ultrasound when stimulated with vibration sonoelastography (Sikdar et al. 2009). As of the writing of this book, neither of these methods has proven to be very efficient as a diagnostic tool, though. Finding the trigger points by the touch

of a trained practitioner is still the gold standard. Trigger points can also be viewed by both electron and light microscopy in fresh human cadavers and in live animal biopsies (not a good option for patient diagnosis either!). In the second edition of volume 1 of the *Myofascial Pain and Dysfunction: Trigger Point Manual* (1999), Travell and Simons include a very elucidating microscopic photograph of a trigger point in a dog's leg muscle (figure 2.6). This photograph will be discussed in detail in the next section.

The area of a trigger point can also be biopsied and the chemicals measured. Researchers at the National Institutes of Health (NIH) have developed a novel technique to sample the trigger point environment in a living person and compare it to normal muscle tissue. Current studies reveal that there is an unusual mix of biochemicals present at active trigger points. This acidic “milieu,” or soup, involves an increase in many proinflammatory, contractile, and pain-causing substances (Shah and Gilliams 2008; Dommerholt, Bron, and Franssen 2011).

It isn't necessary to understand the science to be able to treat your own trigger points. If you have had enough science for now, skip ahead to the section “Trigger Point Types” later in this chapter. For those who feel the need to go deeper into the science of myofascial pain, it can be a delightful challenge. The physiology of a trigger point is fascinating, but it's complex. Even so, you can simplify the study of trigger points by looking at them in two separate ways: microscopically and electrochemically.

The Microscopic View of Trigger Points

Let's start by seeking to better understand muscle. As seen in figure 2.3, a muscle is made up of *fascicles* bound together by fascia into a section, such as the long head of the triceps muscle. Each fascicle is made up of *fibers*. These fibers actually consist of a bundle of several hundred smaller fibers called *myofibrils*. There are approximately one hundred fibers in a fascicle, and each muscle fiber contains between one thousand and two thousand myofibrils. Interestingly, a myofibril is actually a muscle cell that, because of its unusual length, contains more than one nucleus.

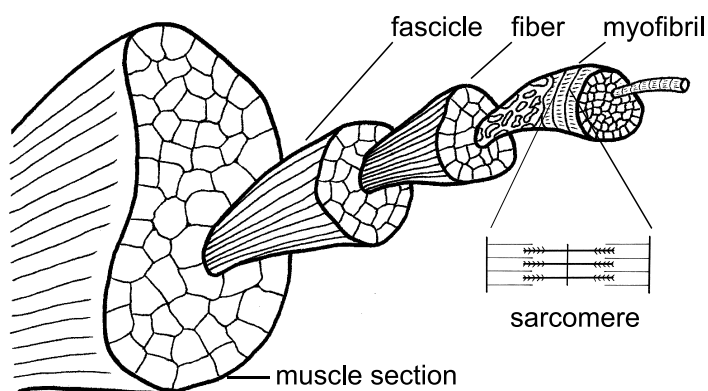


Figure 2.3 Step dissection of muscle tissue, showing a sample muscle section, fascicle, muscle fiber, myofibril, and sarcomere

The smallest unit of muscle contraction that can be seen at the microscopic level is in a tiny part of the myofibril called a *sarcomere* (figures 2.3 and 2.4). Figure 2.4 shows a relaxed and a contracted sarcomere. Note that the contracted sarcomere is considerably shorter.

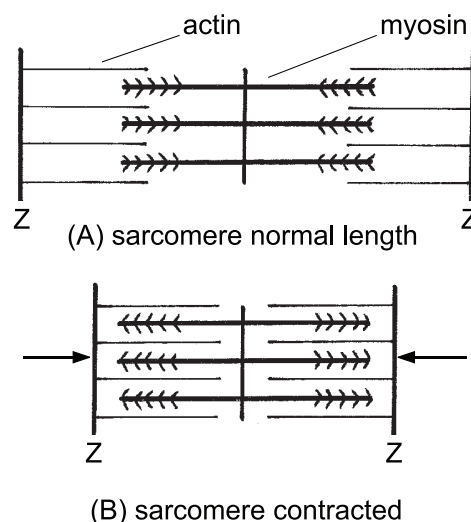


Figure 2.4 The sarcomere, the contractile mechanism of muscle, shown (A) normal length and (B) contracted

Each myofibril is made up of a chain of sarcomeres connected end to end. An element called a *Z band* separates each sarcomere like a thin wall. Note in figure 2.4 that the Z bands in the contracted sarcomere have moved closer together. The length of a fully contracted sarcomere can approach half the length of a fully relaxed sarcomere. It's estimated that the average length of an uncontracted human sarcomere is about 2.5 microns long (Mense and Gerwin 2010). That's small enough to make a sarcomere seem insignificant, but it's actually where all the action is.

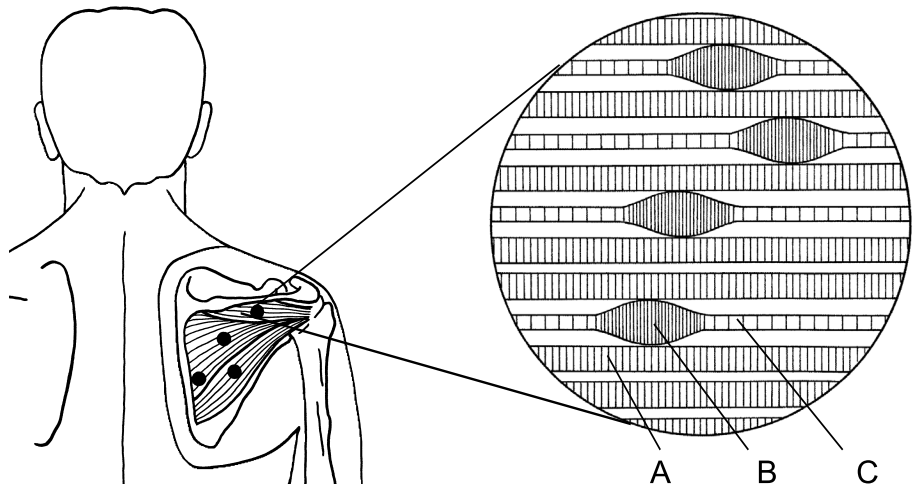


Figure 2.5 Microscopic view of contracted sarcomeres. An actual trigger point may contain many of these tiny knots.

The essential parts of each sarcomere are two filament-like protein molecules: *actin* and *myosin*. Contraction occurs in a sarcomere when the actin and myosin molecules are attracted to one another and come together, somewhat like interlocking your fingers to bring your hands together. This action shortens the sarcomere, which in turn shortens its tiny part of the muscle. The shortening of sarcomeres is the heart of muscle contraction. As you can imagine, millions of sarcomeres have to contract in order to make even the smallest movement.

Relaxation of a sarcomere happens when the actin and myosin are uncoupled from one another and pull apart. They stand ready to reunite at the least urging by an impulse from the nervous system. A trigger point comes into being when overuse causes actin and myosin to become stuck in their interlocked state (Simons, Travell, and Simons 1999).

Figure 2.5 depicts several muscle myofibrils within a trigger point in the infraspinatus muscle of the shoulder. The enlarged illustration in figure 2.5 is a representation of a microscope photograph of a biopsied leg muscle of a live dog that shows the actual sarcomere contracture that makes up a trigger point (figure 2.6). An examination of figure 2.5 clarifies what is seen in figure 2.6 (Simons, Travell, and Simons 1999).

Letter A in figure 2.5 is a muscle myofibril in a normal resting state, neither stretched nor contracted. The tiny vertical Z bands within the fiber mark the ends of individual sarcomeres. The sarcomeres are taller than they are broad but run lengthwise in the myofibril.

Letter B is a knot in a myofibril consisting of a mass of sarcomeres in the state of maximum continuous contraction that characterizes a trigger point contracture. The bulbous appearance of the contracture knot indicates how that segment of the myofibril has contracted, with the Z bands of individual sarcomeres now drawn closer together.

Letter C is the part of the myofibril that extends from the contracture knot to the muscle's attachment (to the head of the humerus

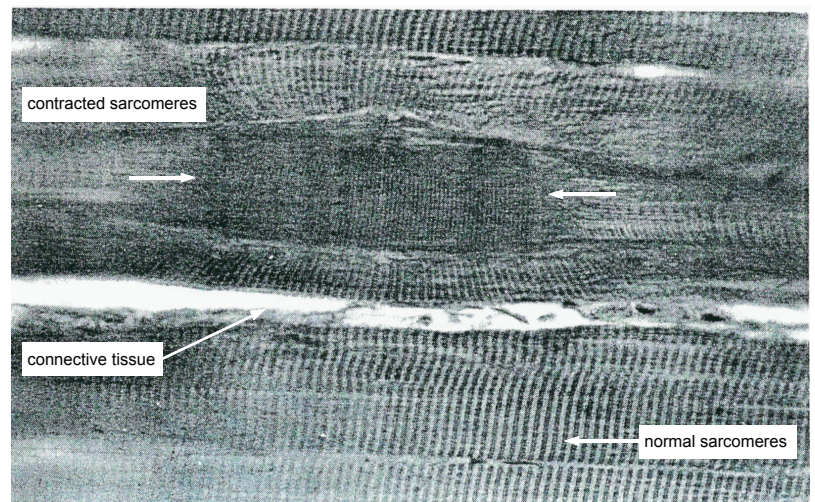


Figure 2.6 A knot of contracted sarcomeres in a myofibril in the leg muscle of a dog at 240x magnification. Reprinted by permission of Simons and Stolov 1976.

in this case). Note the greater distance between the vertical Z bands, which shows how the sarcomeres in this part of the myofibril are being stretched by the tension within the contracture knot. These stretched segments are what give tightness and rigidity to the taut band.

Normally, the action of muscles, alternately contracting and releasing like pumps, helps the heart circulate blood through the tiny capillaries that supply the muscles' own metabolic needs. It is thought that contracture knots may squeeze the capillaries shut and essentially cut off the blood flow in the area. The resulting oxygen starvation and accumulation of the waste products of metabolism cause even more muscle fibers to contract (Sikdar et al. 2009). This is also why nonsteroidal anti-inflammatory drugs are not effective in the treatment of trigger points (Mense and Gerwin 2010). When a sufficient number of contracture knots are created, they take on the group identity of a myofascial trigger point (Simons, Travell, and Simons 1999).

The Electrochemical View of Trigger Points

This section will be of interest if you can handle a little chemistry. Amazingly, high school biology textbooks now deal quite thoroughly with muscle physiology on this level and actually go even deeper into it.

Muscle Metabolism

The electrochemical processes that occur in the muscles of the body are all part of *muscle metabolism*, which encompasses the basic functions of contracting and relaxing. The act of contraction in a muscle and the resultant motion can't occur without muscle metabolism, and metabolism can't occur without an energy source (food). Metabolism proceeds by transforming the glucose in food into glycogen and fat molecules, which are used for energy storage. When cells need energy, glycogen and fat are converted into the molecule *adenosine triphosphate* (ATP), which assists in many cellular processes, including serving as a carrier of energy. The role of ATP in muscle contraction will be explained a little further on.

Muscle Contraction

Muscle contraction usually begins as an electrical signal from the brain, although reflexive muscle action (for example, when a doctor taps your knee with a reflex hammer) needs only an impulse from the spinal cord. In both cases, the signal is taken to the muscle by a motor nerve, which is actually a complex sort of cable containing thousands of individual nerve fibers called *axons*.

An axon connects its nerve cell, or *neuron*, to the individual muscle fibers. Note that the axon divides into multiple parts and ends just short of the muscle fiber. The capillaries that supply blood to the area usually parallel the nerve (figure 2.7). As the message from the central nervous system travels down the motor nerve axon, it opens gates for *calcium ions* to be released. The influx of calcium causes *acetylcholine* (ACh) to be released into the tiny gap between the motor nerve axon and the motor endplate of the muscle called the *synaptic cleft*. The acetylcholine is the transmitter substance of the neuromuscular

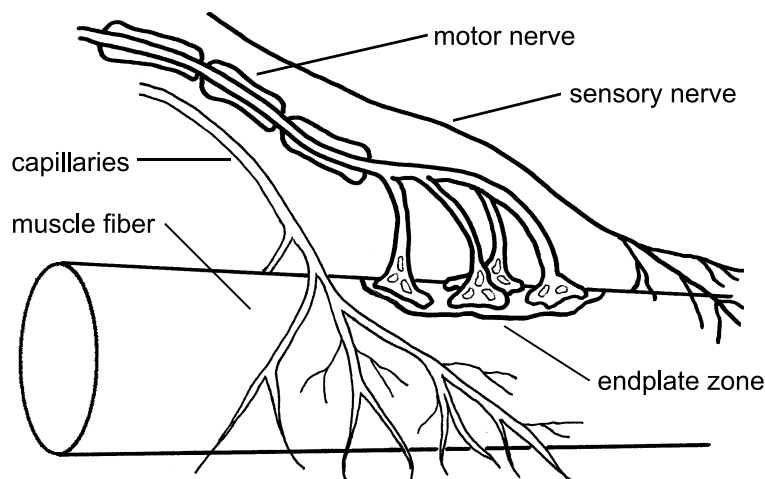


Figure 2.7 The motor endplate zone in a muscle fiber

junction. Acetylcholine activates nicotinic acetylcholine receptors at the muscle end, opening ion channels (namely Na^+), which leads to the *action potential*. This action potential is transported into the muscle fiber, where it releases stores of calcium from the *sarcoplasmic reticulum* (SR). These calcium ions expose the binding sites on the actin, allowing the myosin heads to bind to it. This shortens the sarcomere.

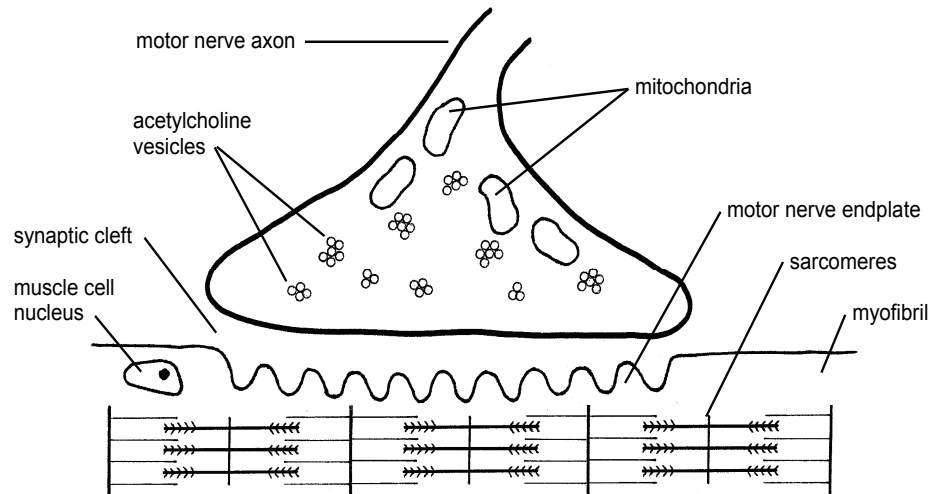


Figure 2.8 Neuromuscular junction with the sarcomeres and the muscle relaxed

Figure 2.8 shows an individual motor endplate of the muscle before the release of acetylcholine, when the sarcomeres are relaxed. Figure 2.9 shows how the flow of acetylcholine affects the sarcomeres, causing them to contract and shorten. The sarcomere contraction continues until the bond between the myosin head and the actin filament is uncoupled by ATP. ATP also acts to reabsorb calcium back into the sarcoplasmic reticulum, reducing the stimulus for contraction.

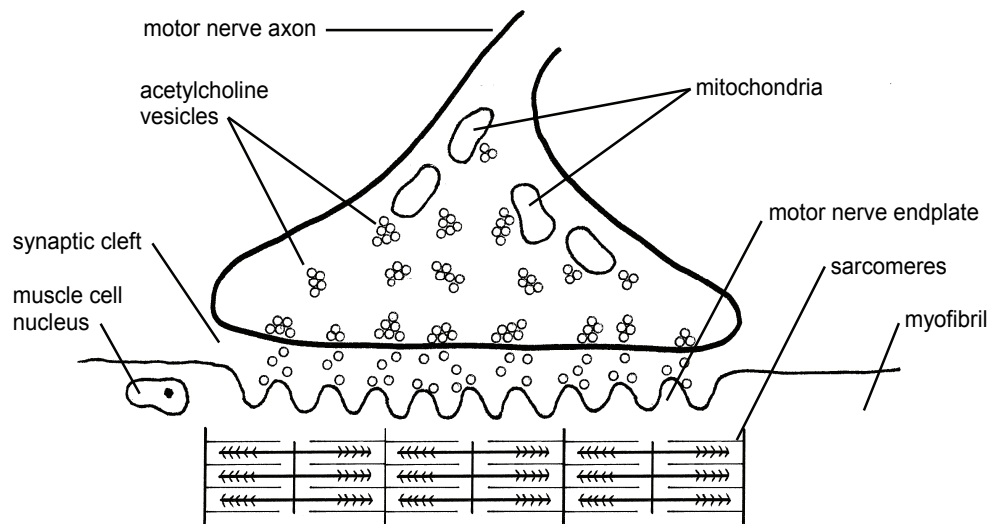


Figure 2.9 Neuromuscular junction with the sarcomeres and the muscle contracted

The Integrated Trigger Point Hypothesis

The problem of trigger points begins with sudden muscle overload, sustained low-level isometric contractions, eccentric contraction (when a muscle contracts and stretches at the same time), chronic muscle tension, gross trauma, overuse, or sustained rapid movement.

The problem of trigger points begins with sudden muscle overload, sustained low-level isometric contractions, eccentric contraction (when a muscle contracts and stretches at the same time), chronic muscle tension, gross trauma, overuse, or sustained rapid movement.

The key process in the energy crisis occurs when reduced ATP stops the reuptake of calcium into the sarcoplasmic reticulum in the muscle cell. This is important because the sarcomeres can't relax and lengthen as long as calcium is present. An excessive concentration of calcium in the axon initiates the release of ACh, which travels across the synapse to the muscle fiber and activates a release of more calcium ions there. Calcium ions are the immediate mediators of contraction, being the substance that directly stimulates the actin to link up with the myosin. In addition to the increased electrical action potentials created by stimulation of the motor nerve, a number of chemical reactions also result in more acetylcholine release. Current research has led to a more complex expanded hypothesis, not included in

figure 2.10. These studies have found the pH of the cell is lowered to 4 to 4.5—a pH of 6.5 to 7 is normal—by the increased workload and resulting lack of oxygen, which in turn releases calcitonin-gene-related-peptide (CGRP), which enhances the release of acetylcholine. CGRP also simultaneously inhibits *acetylcholinesterase* (AChE), the chemical that breaks down acetylcholine. All of this creates a vicious feedback loop that perpetuates the contraction of the sarcomeres at the neuromuscular junction, like a skipping CD or record. As this cycle continues, elevated concentrations of pain-producing substances are released. These chemicals cause sensitivity by stimulating the *nociceptors* (sensory receptors that respond to potentially damaging stimuli) in the free nerve endings, which then communicate that there is a problem by making pain locally at the trigger point and sending a pain message

All of these factors activate the release of acetylcholine (ACh), which causes the sarcomere to contract and constrict the capillaries that supply the muscle's metabolic needs. Failed circulation, or *ischemia*, then impairs the mitochondria, which fail to produce and release ATP, the energy molecule. Since energy is needed to detach the myosin heads from the actin filaments, the absence of ATP leaves the sarcomeres in a shortened and contracted state (Simons, Travell, and Simons 1999). This energy crisis creates a vicious cycle of occurrences at the muscle motor endplate that is believed to be the basis for formation of myofascial trigger points. The integrated trigger point hypothesis takes this energy crisis hypothesis a little further by suggesting that excess ACh is present at the motor endplate because several additional factors that would inhibit ACh are disabled (figure 2.10).

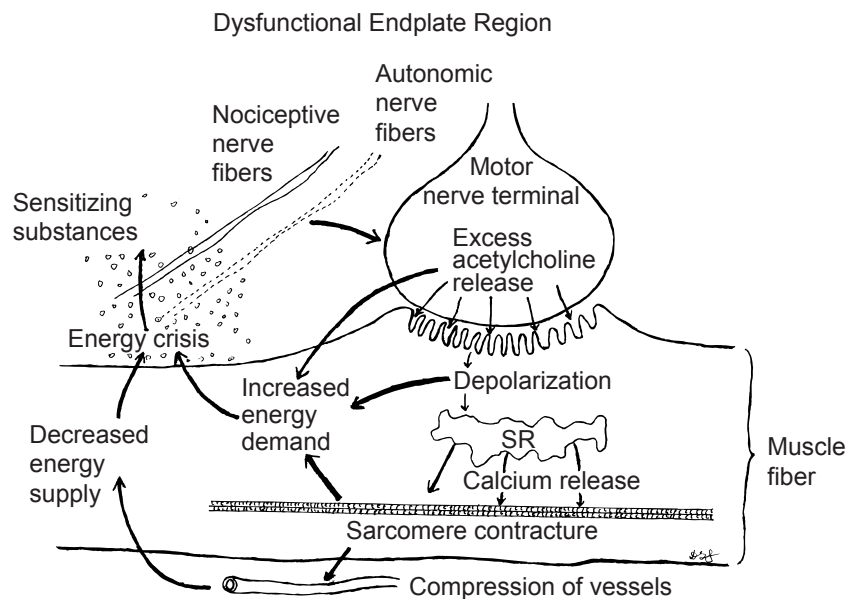


Figure 2.10 Integrated hypothesis. Reprinted by permission from Simons, Travell, and Simons 1999.

to the central nervous system (Simons, Travell, and Simons 1999; Shah and Gilliams 2008; Dommerholt, Bron, and Franssen 2011).

Breaking the Cycle

A trigger point can be deactivated by almost any technique that causes the myosin heads to release the actin filaments, thereby allowing the sarcomeres to lengthen. However, the muscle can't be forced to relax, nor can it be forced to lengthen without the risk of stimulating further release of acetylcholine. The safest and most effective way to break the vicious cycle that maintains the trigger point is to increase blood circulation, which very quickly increases the supply of oxygen and energy to the muscle tissues. With the restoration of the energy supply, the reuptake of calcium will begin again, allowing the sarcomeres to lengthen. Massage of the trigger point may be the most noninvasive and risk free means for establishing renewed circulation through the capillaries in the affected area (Simons, Travell, and Simons 1999). Recent studies show dry needling trigger points with solid filament needles to be a very direct and efficient way to interrupt the cycle of trigger points (Dommerholt, Bron, and Franssen 2011).

The illustrations in this book will lead you to areas where trigger points are known to happen, but it is important that you also search the entire muscle slowly for other taut bands and exquisitely tender trigger points.

Trigger Point Types

Trigger points can be very different in terms of their importance. It's a good idea to be able to recognize the differences before treatment begins because your success may depend on it. It's important to note that all classes of trigger points—primary, satellite, active, and latent—have an important diagnostic characteristic in common: they all hurt when you press on them. Before we discuss the classes of trigger points, let's look more closely at muscle fibers.

Muscle Fibers

As discussed earlier in this chapter, trigger points occur at the place where the motor nerve tells the muscle to do its job, the neuromuscular junction. This once was thought to be a very precise location, but now we know that this area is spread out a little and that motor nerves innervate the muscle at multiple sites. It is possible to have multiple trigger points and taut bands in any muscle. We also used to think of trigger points in terms of being either “central” or “attachment” points. Central trigger points were defined as occurring at the belly of the muscle fiber where the motor nerve entered the fiber. Attachment points were defined as occurring at the muscle's tendinous attachment to the bone. The research has not proven the existence of attachment points, so the distinction based on location has recently been dropped (Dommerholt, personal communication with author, 2012). Trigger points are known to occur anywhere a motor nerve innervates the muscle. The illustrations in this book will lead you to areas where trigger points are

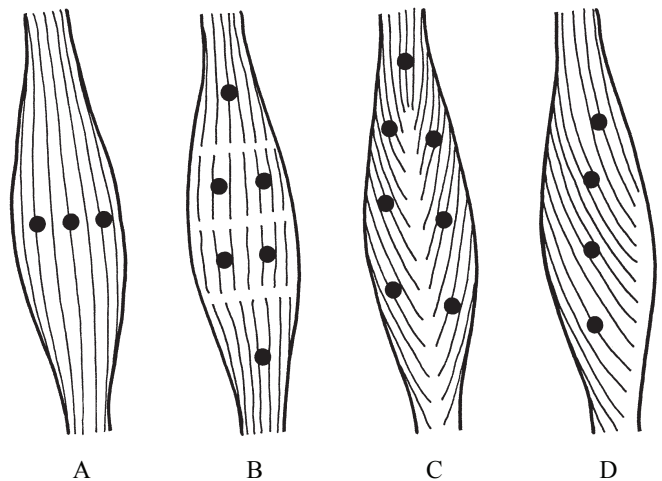


Figure 2.11 Orientation of muscle fibers: (A) parallel, (B) parallel with tendinous inscriptions, (C) bipennate, and (D) unipennate

known to happen, but it is important that you also search the entire muscle slowly for other taut bands and exquisitely tender trigger points.

To search a muscle in detail, it is helpful to know how the fibers run in the muscle. The arrangement of muscle fibers can be very different depending on the job the muscle is designed to do (figure 2.11). In a muscle made for speed, the fibers are parallel as in (A). In a muscle made for power, however, the fibers run at an angle to its length. These fiber arrangements resemble a feather (C) or sometimes half a feather (D). The middle deltoid muscle is constructed this way. Interestingly, in a muscle with this sort of fiber orientation, all the fibers are the same length (Simons, Travell, and Simons 1999). Another variation is when a muscle is made of several sections, or heads. Often the name of the muscle tells you how many heads it has: the biceps, triceps, and quadriceps, for example, have two, three, and four heads, respectively. Each head can have a fiber arrangement quite different from the others. In good anatomical drawings of muscles, the direction of the fibers is clearly shown. Certain other muscles are divided into sections by *tendinous inscriptions*, or cross bands of connective tissue (B). This makes the muscle like a string of sausages, each with its own belly. As a result, trigger points can occur at several sites along the muscle's length. If you're unaware that more than one section can exist in a muscle, you could easily miss critical trigger points. Examples of this kind of muscle are the rectus abdominis (your stomach muscle), and the gracilis, sartorius, and semitendinosus muscles in the thigh, all of which are long muscles built to exert great power (Simons, Travell, and Simons 1999).

Primary and Satellite Trigger Points

A trigger point will very often generate trigger points in other muscles that lie within its pain referral zone (figure 2.12). These are known as *satellite trigger points* (this term encompasses “secondary trigger points,” a term that’s no longer used). The trigger point sponsoring the satellite is a *primary trigger point* or *key trigger point*: the distinction between the two is that a trigger point isn’t a primary trigger point unless it has satellites in other muscles.

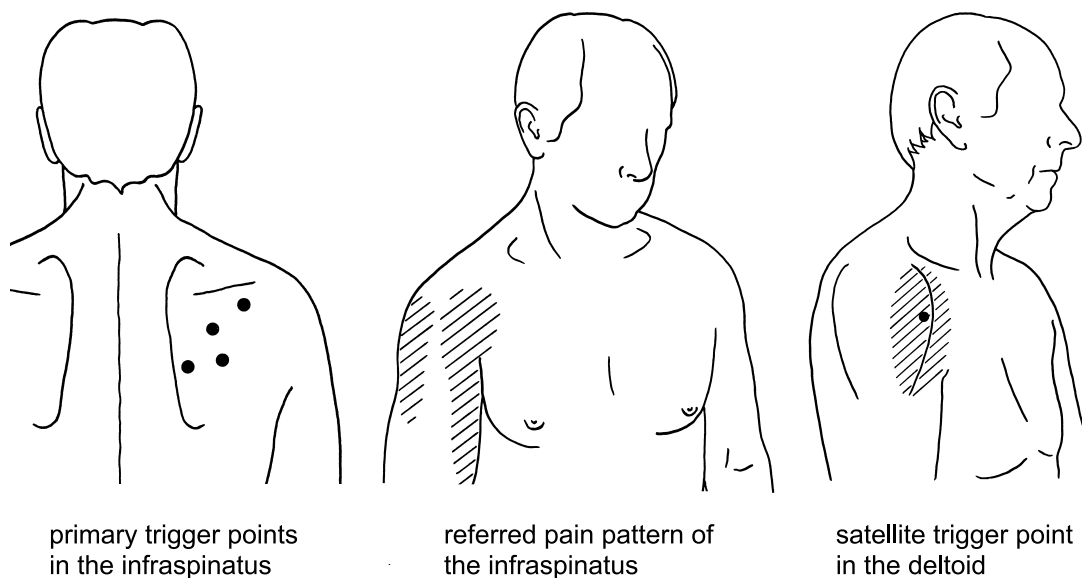


Figure 2.12 Deltoid trigger point created in the referred pain zone of infraspinatus trigger points

Long-term persistent pain is often a compound effect from a chain of satellite trigger points created in a kind of cascade from muscle to muscle, the classic domino effect. It's not unusual for an entire side of the body to be

affected. Satellite trigger points often resolve without treatment when the primary trigger point is deactivated. By the same token, satellites can be difficult if not impossible to deactivate if the primary trigger point is overlooked.

Referred pain from diseased internal organs can also promote satellite trigger points, usually in the muscles of the chest, shoulder, back, pelvic floor, and abdomen. This little-known dynamic can lead to trigger points that keep coming back in these areas despite seemingly effective trigger point therapy. In such case, the internal problem would be functioning as a primary trigger, and the recurring trigger points could be viewed as satellites. This circumstance should alert you to a possible internal problem (Simons, Travell, and Simons 1999). See the section below on visceral referral for more information. It is possible for trigger points to continue to exist and cause pain even after the primary disease or problem has been resolved.

Active and Latent Trigger Points

Trigger points are also classified on the basis of their activity or inactivity. *Active trigger points* cause spontaneous pain with or without motion. *Latent trigger points* are inactive and don't cause spontaneous pain. Both active and latent trigger points are associated with joint stiffness and reduced range of motion. Latent trigger points are far more common than active trigger points. Travell and Simons believe that accumulated latent trigger points are one primary factor in the characteristic inflexibility and joint stiffness of old age. Latent trigger points are easily converted into active trigger points by stress, strain, or overuse of the muscles involved (Simons, Travell, and Simons 1999).

The long, overstretched muscles are the “victims” of the real troublemakers, the short, tight muscles. You will find that treating only the crying trigger points won't solve the problem. Massage of the short, tight opposing muscles and their trigger points will actually be more productive.

“The Victims Cry, the Perpetrators Don't”—Antagonist Trigger Points

There is also the mechanical phenomenon of muscle imbalances where one set of muscles is short and tight and its opposing muscles are long and overstretched. Often, but not always, the long, overstretched muscles develop trigger points as a defense strategy. Sometimes these antagonist or opposite trigger points become active and cause all of the symptoms. The long, overstretched muscles are the “victims” of the real troublemakers, the short tight muscles. You will find that treating only the crying trigger points won't solve the problem. Massage of the short, tight opposing muscles and their trigger points will actually be more productive (Waslaski 2011).

If you find you are not solving the problem, figure out what action would stretch the muscles that are “crying”—that is, the ones that have the trigger points causing your referred pain. Often the long, overstretched muscles that develop active trigger points are shortened by the actions of muscles that decrease the angle of the joint. *Flexion* is the term used to describe a decrease in the angle of a joint. For example, the biceps muscle, on the front of the upper arm, flexes, or “bends,” the elbow, thus decreasing the joint angle from about 180 degrees to about 40 degrees. The triceps on the back of the upper arm extends, or makes larger, the angle. Once you identify which muscles are shortening the angle and putting the symptomatic muscles on a stretch, massage the muscles that are doing the shortening; these are the mechanical “perpetrators.” A general shortcut is to focus on the front of the body because many of us live much of our lives bent into flexion. Some have called this *flexion addiction*, and it comes from too much sitting, slouching, and working with our arms out in front of us. Some of the most

Here are some examples of long, overstretched muscles at odds with short, tight muscles:

rhomboids versus pectoralis major

infraspinatus and teres minor versus subscapularis and pectoralis major

superficial spinal muscles versus abdominal muscles

hamstrings versus the rectus femoris

triceps versus the biceps

supinator versus pronator teres

common sites of muscles shortened by flexion are the front of the hip, abdomen, chest (called *protraction*, or slumping the shoulders forward), shoulder (called *medial rotation*, or turning the upper arm bone inward toward the midline), and forearm (*pronation*, or turning the hand palm-down). Engaging the help of an advanced massage therapist or physical therapist can be really useful in figuring out postural or mechanical dysfunction that can be causing active trigger points. Generally, if someone wants you to stretch a muscle, it is usually a good idea to massage its trigger points first.

Trigger Point Symptoms

The symptoms produced by trigger points are actually quite diverse and aren't limited to pain sensations. Other abnormal sensations can include numbness, tingling, hypersensitivity, and a sense of burning. Physical problems caused by trigger points include weakness, a lack of coordination, stiffness, swelling, and reduced range of motion.

Pain generated by trigger points can range from a vague aching to pain so severe you're completely unable to function. Trigger point pain can also be either acute or chronic. By definition, acute pain is of recent onset, a symptom you've had for just hours or days. In contrast, chronic pain is a condition that has existed for weeks, months, or years. When trigger points have existed long enough to cause chronic pain, they can be much more difficult to get rid of than if they had been treated earlier.

Pain generated by trigger points can range from a vague aching to pain so severe you're completely unable to function.

Referred Pain

Although the symptoms of trigger points are diverse, their most characteristic effect is referred pain or sensation, the displacement of pain or sensation from its source to some other part of the body. The concept isn't new. Pain sent from internal organs to the musculoskeletal system has been familiar to physicians for many generations.

Visceral Referral

The technical term for pain referral from your internal organs is *viscera-somatic referred pain*, and it's a very common occurrence (Simons, Travell, and Simons 1999). Symptoms of internal disease are often manifested by some kind of external pain. See figure 7.1 for examples of referred pain from various organs.

Pain referral can also occur in the opposite direction, sent from your muscles to your internal organs. This is called *somato-visceral referred pain*. Visceral pain referred from trigger points in your back or abdominal muscles can mimic symptoms of an ulcer, gallstones, heart trouble, colitis, interstitial cystitis, or cancer (Simons, Travell, and Simons 1999). Sometimes it is difficult to tell which condition is causing which. If treating trigger points does not significantly reduce your symptoms within a couple of days or weeks, it would be wise to err on the side of caution and rule out any other nonmuscular medical conditions. Severe symptoms warrant prompt medical attention. It's also important to listen to your intuition if your gut is telling you something is wrong.

Musculoskeletal Referral

Within your musculoskeletal system, the direction of pain referral from a trigger point is almost always—about 85 percent of the time, in fact—away from the center of the body. The rest of the time, the pain is shifted more toward the center of the body or occurs around the trigger point site. Referred pain, in most cases, is felt as a deep, oppressive ache, although movement can sometimes sharpen it to a lightning-like stab of pain. Referred myofascial pain can be as intense and intolerable as pain from any other cause. It should be noted that the pain level depends more on the degree of peripheral and central sensitization than on the size of the muscle. Trigger points in the tiniest muscle can cripple you with pain (Simons, Travell, and Simons 1999).

Common examples of referred myofascial pain include tension headaches caused by trigger points in neck muscles (figure 4.3), back pain from abdominal trigger points (figure 7.23), and knee pain referred from trigger points in the quadriceps muscles (figure 9.9). Stiffness and pain in a joint should make you think first not of arthritis but of possible trigger points in associated muscles. Pain in such joints as the knuckles, wrists, elbows, shoulders, knees, and hips are classic trigger point symptoms.

A common rule regarding referred pain is that a painful spot in a muscle isn't a trigger point unless it refers pain when you press on it. It may take ten to fifteen seconds before referred sensation happens. With compression, some people feel referral from every trigger point exactly like in the diagrams. Others feel only a slight tingling or sensation even from the most intense active trigger points. You can't depend on the reproduction of intense referred pain patterns as a diagnostic criterion when massaging trigger points. A trained clinician needling a trigger point directly is much more likely to elicit the referral pattern (Dommerholt, personal communication with author, 2012). The only way to reliably verify whether a specific trigger point is causing a specific pain is to deactivate the trigger point and see if the pain remains.

How Referred Pain Works

Currently, there are several relevant theories that help to explain referred pain. The simplest theory to understand is that the signals simply get combined and misinterpreted in your neurological wiring. This idea originated with Theodore Ruch and is known by physiologists as the *convergence-projection theory* (Fulton 1947). Dr.

Ruch established that single second-order neurons (nerve cells) in the spinal cord actually receive impulses from first-order sensory neurons in several sources: the viscera, the skin, the joints, and the muscles. These electrical signals are integrated and modified at the spinal level before being transmitted to the brain. Since various signals can be processed at the same time at the same spinal level, these signals essentially become one. Researcher and clinician Jan Dommerholt explains it like this: "It is kind of like different streams from the moun-

Referred pain, in most cases, is felt as a deep, oppressive ache, although movement can sometimes sharpen it to a lightning-like stab of pain.

There are five things that should alert you that a visceral problem could be causing part or all of your pain (adapted from Gray 2004, 361):

1. Your pain is constant and doesn't change with changes in body position or activity.
2. Pain increases with exertion that doesn't stress the areas of pain. Example: shoulder pain that increases with walking.
3. Pain increases after eating, during bowel or bladder activity, or while coughing or breathing deeply.
4. Pain is accompanied by gastrointestinal symptoms like indigestion, nausea, vomiting, diarrhea, constipation, or rectal bleeding.
5. You also have symptoms such as fever, night sweats, pale skin, dizziness, fatigue, or unexplained weight loss. Be aware, however, that trigger points can also cause nausea, dizziness, and fatigue, and that it is common to have both trigger points and visceral referred pain concurrently.

tain joining into one river. Once the water of each stream is in the river . . . they become one and the same” (Dommerholt, personal communication with author, 2012).

The *central hyperexcitability theory* says that tissue-damaging or potentially damaging events stimulate receptive fields in the original dorsal horn neurons of the spinal cord associated with a particular muscle and also wake up receptive fields on other distant latent dorsal horn neurons. It is theorized that this sensitization of distant but convergent dorsal horn neurons is what induces referred pain (Dommerholt and Fernández de las Peñas, 2013). Because the signals get combined and mixed up before being interpreted by the brain, the resulting referred pain gets projected along the entire nerve pathway supplied by a particular spinal nerve, even to areas of the tissue that were not subject to the original stimulation. Referred pain is usually, but not always, segmental, occurring in the myotomes innervated by the same spinal motor nerve root. This means that groups of muscles that are supplied by the same motor nerve are linked in their patterns of referred pain, too.

Central sensitization is a hyperexcitability of the central nervous system characterized by hypersensitivity to pain and to normally nonpainful stimulation. Research has demonstrated that both latent and active trigger points provide nociceptive input to the dorsal horn neurons of the spinal cord (Dommerholt and Fernández de las Peñas, 2013). *Nociception* is defined as “events in the peripheral and central nervous system that are associated with the processing of electrical signals elicited by tissue-threatening stimuli,” (Mense and Gerwin 2010). This means that trigger points are interpreted by the nervous system as a threat. As Jan Dommerholt puts it, the constant nociceptive input from latent and active trigger points can lead to muscle overload or even disuse and ultimately to the development of peripheral and central sensitization (Dommerholt 2011).

In this book, the primary referred pain pattern is documented in the drawings. This is often the most intense and most common pain pattern. The secondary pain pattern, which happens less often, is described in the text. The Pain Guide at the beginning of each chapter lists every muscle known to commonly cause pain in a particular area. Be sure to consult the Other Symptoms Guide in each muscle chapter for a quick reference to other details.

Luckily, for the practical purpose of treating trigger points, it’s not necessary to understand the neurology of referred pain. You just have to understand that referred pain is real, extremely common, and fairly predictable.

Janet Travell’s great discovery was that referred pain occurs in predictable patterns in everyone with only small variations. It’s notable that referred pain occurs most often in or near a joint, locations where pain

is most likely to make you modify the activities or conditions that created the problem (Simons, Travell, and Simons 1999).

It is important to know that referred pain patterns sometimes vary a bit from person to person. As mentioned earlier, it is also possible for additional trigger points to occur throughout the muscle, but only the referred pain patterns for the most common trigger points have been documented. Furthermore, not all of the skeletal muscles in the body have been documented with trigger points, but, in theory, it is possible for all muscles to have them. The science of myofascial pain continues to evolve.

Neurological and Vascular Symptoms

Muscles remain under some degree of tension when afflicted with trigger points. This tightness in muscles can cause compression of nerves that pass through the muscles or near them. Nerve compression typically results in abnormal sensations, such as numbness, tingling, burning, hypersensitivity, or an electric kind of pain in the areas served by the nerve. For example, taut bands in the scalene muscles in the neck that cause shoulder and upper arm pain can also be the source of numbness, tingling, and burning sensations in the forearm, hand, and fingers (figures 5.2 and 5.3).

Taut bands can also cause a muscle to clamp down on a vein, impeding blood flow in the area served by the vein. When the scalene muscles in the neck tighten, for example, they can pull up the first rib and compress the subclavian vein, which may cause blood to pool in the hand, which then becomes temporarily warm and swollen. Raising your hands up in the air speeds the blood back up the arm and resolves the swelling. Trigger points cannot cause blood clots. If you have acute symptoms including pain, swelling, heat, and redness in an area, it is wise to consult a physician before beginning treatment. If these symptoms happen in the calf, see a physician immediately: there is a possibility of a blood clot.

It's also important to understand that sustained compression of a nerve can instigate the formation of trigger points in the areas served by the nerve. For example, a herniated lumbar disk pressing on the motor nerve roots of buttock and leg muscles creates trigger points that are partly responsible for the characteristic buttock and leg pain of sciatica. In this case, the trigger points in the buttocks and legs will likely be extremely tender to the touch and will not resolve with treatment until the compression of the nerve is completely resolved.

Symptoms of Physical Dysfunction

In addition to pain and other sensory symptoms, trigger points typically disturb the physical functioning of muscles. This can show up as weakness; for example, the vastus medialis trigger point that sends pain to the knee, as shown in figure 9.15, can also make the knee give way unexpectedly. Weakness caused by trigger points in the muscles in the tibialis anterior can cause you to trip and stumble (figure 10.2). This kind of muscle weakness doesn't involve true atrophy, so exercise isn't an appropriate therapy. Strength will return quickly when the trigger points have been deactivated.

Trigger points also cause stiffness by keeping the muscle from lengthening. Such tightening in muscles associated with a joint can reduce your range of motion. A stiff neck, a back that won't bend, and a frozen shoulder are all examples of joint stiffening that can be caused by myofascial trigger points. When the muscles controlling a joint have a paradoxical combination of tightness in some of the muscles and weakness in others, it can create an imbalance that results in joint dysfunction. The joint then fails to operate smoothly because the bones catch or rub together abnormally. Muscle imbalances can be the reason for clicking and popping noises in joints. A thumb joint that catches, a clicking in your jaw, or a popping in your shoulder when you move your arm may be the result of joint dysfunction.

Muscles that stay chronically shortened because of trigger points can be the source of poor posture. Tight pectoral muscles are responsible for keeping the shoulders rolled forward and for sponsoring the humped upper back associated with a habitual stoop. Long-established habits of posture can't be corrected by self-discipline alone. Permanent postural change can be accomplished with the assistance of trigger point massage, stretching, and then targeted exercise to strengthen the opposing overstretched muscles (Mense and Simons 2001; Waslaski 2012).

Trigger points also make it hard for the muscles to recover after exertion. Muscles afflicted with trigger points never really get a chance to rest, which causes them to tire unnecessarily. Athletes may see the effects of delayed recovery, delayed relaxation, and decreased endurance sooner than people who are less active. After trigger point massage, you may find you can throw a baseball faster, bench press more weight, carry the baby longer, and have more ability to do daily tasks.

Autonomic Disturbances

Trigger points can be responsible for a number of additional physical symptoms that you wouldn't think they could cause. These symptoms are very different from one another and have little to do with pain, so you may find it hard to believe they're caused by trigger points. Your skepticism may not diminish until you've experienced some of these effects yourself.

These odd symptoms are expressions of unusual activity in the autonomic nervous system, which regulates the glands, the smooth muscles of the digestive system, the blood vessels, the heart, the respiratory system, and activity in the skin. Travell and Simons list some of the known autonomic effects of trigger points as reddening and excessive tearing of the eyes, blurred vision, a droopy eyelid, excessive salivation, and a persistent runny nose. Trigger points in neck muscles can bring about dizziness, poor sense of balance, a chronic cough, sinus congestion, and chronic sinus drainage. Ear stuffiness and a kind of fluttering sensation in the ear can come from trigger points in the medial pterygoid muscles of the jaw. Another trigger point nearby in the masseter can cause the exasperating deep ear itch that nothing seems to reach. Amazingly, there's a trigger point in the pectoralis major that can cause an irregular heartbeat. Trigger points in the infraspinatus can even cause excessive sweating in the hands (Simons, Travell, and Simons 1999).

Causes of Trigger Points: Types of Muscle Abuse

Many of the activities and events that create myofascial trigger points are obvious and understandable: accidents, falls, muscle strain, and the infinite varieties of muscle overuse. Working at the computer, studying slumped at a desk, or holding your book over your head while you lie down will all cause low-level constant contraction of several muscle groups. This *submaximal isometric muscle contraction* (contracting but not shortening), is a major cause of many trigger points. Muscles like to work hard for a short while then relax fully.

A one-time episode of overdoing, for example, is notorious for ending in debilitating pain that long outlasts the activity. You've probably lifted too much or carried an unreasonable load on occasion, or ambitiously overexercised when out of condition. One time or another, you've hammered away too long and too hard at some unaccustomed type of work.

Eccentric muscle contraction can also get you into trouble. As I mentioned above, eccentric muscle contraction happens when a muscle has to lengthen and contract at the same time. A perfect example of this occurs with a portion of the quadriceps muscle group known as the vastus medialis, which controls your decent when going down a hill or stairs. Muscles work in this fashion—that is, a lengthening contraction—during all kinds of movement or exercise due to the braking force involved in protecting a joint from damage. Eccentric (lengthening) contraction opposes concentric (or shortening) contraction. Overdoing eccentric contraction causes muscle stress including the development of trigger points and delayed-onset muscle soreness.

Preventable Muscle Abuse

Any of these things has the potential to get you into trouble. Even if you know exactly how your problem started, it's a good idea to look more closely at your activities in the interest of heading off a recurrence. The first thing to do to deactivate a trigger point is to stop or limit the action that is feeding the trigger point. Sometimes, as in the case of work-related repetitive strain injuries (see "Muscle Abuse at Work" below), ceasing the activity that has created the trigger point is difficult but not impossible. Small changes to improve ergonomics and taking regular breaks will help quite a bit.

Also, it's important to know that you don't necessarily have to avoid an activity or a sport that has gotten you into trouble. There may simply be a factor that you've overlooked. The idea is to learn which muscles are at risk in a particular activity and be ready to treat trigger points in them. Self-applied trigger point massage is a skill that will give you a wonderful advantage throughout your life. It helps you nip problems in the bud before they deteriorate into an unmanageable condition.

Muscle Abuse at Work

It's important to look critically at a work situation that causes pain. Although trigger points are actually quite easy to deal with when you understand them, they can come back very quickly if you don't change the conditions that bring them on. Many issues of work style can be examined, but all of them come down to a question of economy of motion, efficient use of energy, and relaxation. In your own work situation, you can do a lot of good for yourself no matter what is imposed on you by management and circumstance. Be on the lookout for ways you can use your tools and place your materials and supplies that will reduce unnecessary strain and effort. Mindfulness can make a tremendous difference in preventing overuse of muscles. In the case of muscles being underutilized or held in a low-level contraction for hours on end, varying your activities or fully contracting then lengthening your muscles can keep trigger points from forming. Short sessions of lifting a five- or ten-pound dumbbell periodically during your work day helps to keep the circulation moving in muscles that have to stay slightly contracted all day.

Self-applied trigger point massage is a skill that will give you a wonderful advantage throughout your life. It helps you nip problems in the bud before they deteriorate into an unmanageable condition.

A great example of a problem area is the computer, which is universally recognized as a major cause of repetitive strain. Trouble caused by overuse tends to sneak up on you, especially with something like working at a computer keyboard, which can seem harmless at the time you're doing it because it feels so effortless. Digging ditches could hardly give your muscles more grief.

Use elbow and wrist support to make it easier for your arms, neck, upper back, and shoulders. Position the keyboard so you don't have to hold the weight of your arms out in front of you. Get the monitor up high enough so you can sit up with your head balanced on your neck, not with your neck bent and your head hanging forward. Prop books and papers up at an angle so your neck can remain in neutral.

The mouse is another insidious cause of trouble, not only for the fingers and hand, but also, surprisingly, for the shoulder. When the mouse is placed to the far right or left of the keyboard, it puts the arm into outward rotation. This requires the infraspinatus and teres minor muscles to contract every time you use the mouse, adding up to a significant amount of overuse in the course of a day.

A touchpad mouse is good ergonomic solution, requiring only a light tap on the pad to execute a click instead of contraction of finger and forearm muscles. If you use a desktop computer, consider an ergonomic keyboard with angled keys. Some people find sitting for long hours to be the worst part of their job. There are desks now that easily rise up to accommodate a standing or sitting worker; see www.ergotron.com for more information. Some folks are finding walking slowly on a treadmill with a desk built onto it to be the answer. It is worth your time to investigate better ergonomic solutions for your workstation. Invest in your own office equipment if necessary. It is worth spending your own money to save your body.

Laptop computers, tablets, and mobile devices create all kinds of opportunities for muscle pain. Work smart when using equipment that compromises good ergonomics. Just watching other people engaged in these activities will give you plenty of ideas for improving your own posture. Kindles and other reading devices should be propped up at an angle to limit neck flexion. Use a separate keyboard for a laptop when possible so you can position the screen at eye level. Make a workstation for standing at the kitchen counter with your laptop on a couple of thick books. If you own a smartphone or often use text messaging, it pays to learn how to massage your arm and thumb muscles with small high bounce balls.

Staying in any position too long, even a comfortable position, is hazardous to muscles. A static position favors the formation of trigger points because it hampers circulation. Muscles need a certain amount of contracting and relaxing to stay healthy. Many jobs are static by nature, particularly anything done sitting at a desk. Unfortunately, sedentary or inactive work gives you the impression that your work is easy, that you're not straining anything. On the contrary, you might well be under a great deal of subtle physical strain and not recognize it. Make opportunities to get up and move during the day. Take long strides and do lunges to stretch out your hip flexor muscles after sitting for long periods of time.

At the other end of the scale, intensity can be just as much a problem as sedentary work. Train yourself to work loose. Tune in to your muscles while you're working and hone your awareness of unnecessary tension and any part of the job that encourages it. If you apply yourself, you can learn to selectively relax the muscles you aren't actually using for the task at hand. There's almost always a calmer and ultimately more efficient way to do something if you just stop and think about it. The changes don't have to be big ones. Small changes can make a huge difference.

Repetitive movement overloads muscles, even when it requires only minimal effort. Repetitive movement in more strenuous kinds of work can actually be healthier because you're more apt to be aware of when your muscles are growing tired. Even so, the repetitious nature of many jobs in industry makes it very difficult to permanently subdue myofascial problems. You may have to use self-applied massage on a regular basis to head off pain. If the health of the workers is worth anything to the corporate bottom line, it would be much more cost effective and productive to allow people to vary their tasks a number of times during the day (Simons, Travell, and Simons 1999).

Janet Travell had a great tip for housework that could be applied to almost any kind of job. She recommended scrambling housework, not spending too long a time on any one task. Do a little bit of one job, then come back to it after doing a little of something else. This allows you to come back fresh to each task after a kind of mini break rather than getting locked into a knotted-up position for an unreasonably extended period of time. This little change in work style can be a lifesaver.

Muscle Abuse in Sports

If you're aware of trigger points when they first start up, you can treat them, stay in the game, and stay out of the sports injury clinic. Name your sport—baseball, basketball, golf, soccer, tennis, bowling, Frisbee, hiking, climbing, skating, hockey, wrestling, or running—all present potential dangers for certain muscle groups. No matter what your sport, it would be good to figure out which muscles work the hardest. Then devote yourself to learning how to massage trigger points when you've worked too hard. Muscles that are especially vulnerable should be treated before you play as well as afterward.

Many committed athletes do stretching routines as preventative therapy. Remember that muscles with trigger points are more vulnerable to strains and tears because they actively resist lengthening. You can make better use of stretching if you implement a regular routine of trigger point massage for both the treatment and the prevention of injuries.

Exercise is a classic source of trigger points when overdone or done unwisely. You may find that exercising temporarily takes the pain away, but it returns as soon as you stop. This is a sign that active trigger points are causing your pain. Doing even more exercise in the hope of healing trigger points—working through the pain—is not a good idea. To differentiate between trigger point pain and postexercise soreness, search for trigger points. The soreness of a trigger point occurs at a specific spot in the muscle. With postexercise soreness, the entire muscle hurts.

Other Avoidable Kinds of Muscle Abuse

Along with overdoing it at work and play, there are an unlimited number of other, less obvious, ways to abuse muscles and create trigger points. To begin with, being out of shape and overweight sets you up for the overuse of muscles and the onset of trigger points. And, if you already have pain, get a start on your trigger points before getting into extensive exercise.

Other sneaky things that promote trigger points include awkward sleep positions, especially ones that keep a muscle or group of muscles in a shortened state for hours on end. Sleeping on your stomach is a known cause of low back pain. To begin solving pain from sleeping, don't start with changing your mattress or pillows; massage your muscles first. You may have to change some treasured sleep habits too, but it only takes about seven days to drop an old habit and institute a new one.

Both long evenings sitting in front of the TV or driving long distances have built-in dangers, mainly because of the immobility imposed on certain muscles. Examine your hobbies, household chores, and other day-to-day activities, just as you would the ergonomics of your job or your golf game.

Unavoidable Muscle Abuse

Muscles that suffer in accidents such as falls and auto collisions are bound to be afflicted with trigger points afterward. Trigger points can be a result of either overcontraction or overstretching. Trigger points are a major source of the pain of whiplash, though they too often go unsuspected and unaddressed. Also, any physical injury that entails a fracture, muscle tear, ligament sprain, or joint dislocation is likely to produce an accompanying insult to the muscles involved. Although the muscles may have no visible injury, they're certain to have trigger points (Simons, Travell, and Simons 1999). After an injury is healed and you are cleared by your doctor for massage, explore trigger points in all of the affected muscles.

Unsuspected Muscle Abuse

According to Travell and Simons, many kinds of medical treatment can be an unrecognized cause of trigger points and myofascial pain (Simons, Travell, and Simons 1999). This is called *iatrogenic pain*, meaning that it's caused by medical treatment. As an example, trigger points are frequently initiated by the immobility imposed by braces, slings, and casts. The protective bracing that keeps you from moving an injured arm is a well-known beginning point for the development of frozen shoulder. The leg length imbalance caused by using a walking cast will set up trigger points in the low back and hip muscles.

When surgery leaves long-term residual pain, trigger points should be suspected in muscles that have been cut, stretched, bruised, or otherwise traumatized. Since these trigger points may send pain to places well away from the location of the surgery, physicians may persist in trying to treat the site of the pain, not recognizing it as referred myofascial pain. They may then overlook and fail to attend to the real cause, the trigger points and scar tissue associated with the surgical operation. Adhesions can develop in scar tissue. Once the incision is completely healed, you can begin massaging scar tissue. It is never too late to massage old scars either.

An ordinary injection in the buttocks can set up trigger points that can leave a patient with a case of sciatica. Trigger points caused by an injection in the gluteus medius can leave you with low back pain that you didn't have before. An injection in the shoulder can leave deltoid trigger points.

Pharmaceutical medications continue to be the treatment of choice for pain because they work so well in reducing your awareness of it. But pain must always be viewed as a message that something is wrong and needs attention. It's not enough to kill the messenger with a pain pill and ignore the message.

As an example, Travell and Simons tell about research indicating that calcium channel blockers for hypertension appear to irritate and perpetuate trigger points. In other words, your high blood pressure medicine may be worsening your pain (Simons, Travell, and Simons 1999).

Statin-class drugs, including Lipitor, used to reduce cholesterol are known to cause muscle pain and weakness in 15 percent of patients (Dommerholt, Bron, and Franssen 2011; Sirvent, Mercier, and Lacampagne 2008). Sidney Wolfe, MD, and colleagues in *Worst Pills, Best Pills* (2005), list scores of drugs known to potentially cause muscle pain as a side effect. If you take prescription drugs for any reason, it would be worth your while to look up all of the side effects of your

If you have to take pain medicine while you explore trigger points, work at a lower level of discomfort, perhaps a 3 or 4 on a scale of 1 to 10. Pain medicine may mask your reaction to massage, causing you to overtreat painful trigger points.

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medications. If you're currently taking painkillers, you may be able to do without them by learning self-treatment of trigger points. If you have to take pain medicine while you explore trigger points, massage at a lower level of discomfort, perhaps a 3 or 4 on a scale of 1 to 10. Pain medicine may mask your reaction to massage, causing you to overtreat painful trigger points.

It's important to be aware that trigger points can also be activated by emotional distress, viral infections, Lyme disease, candidiasis, gastrointestinal problems, diabetes, arthritis, joint dysfunction, or visceral disorders. Trigger points that form in response to systemic problems like viral infections, diabetes, and arthritis may be due to their effects on muscle metabolism (Simons, Travell, and Simons 1999).

Trigger Point Perpetuators

Sometimes trigger points can be very hard to subdue. After you seem to have successfully defeated them, you may find that they come right back. Also, it's easy to underestimate the influence of perpetuating factors on myofascial pain, even when you know about them. Hidden influences can be chemical in nature and therefore rather subtle and generalized throughout your system, which makes them difficult to pin down.

The management of perpetuating factors is the most important aspect of treating chronic trigger point pain. It

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can make a critical difference in whether trigger point therapy will succeed and whether its benefits will last. A perpetuating factor is sometimes so important that removing it may allow a trigger point to resolve on its own or at least keep from recurring. Some systemic factors, such as vitamin insufficiencies, can actually be the initiating circumstance in the creation of trigger points (Simons, Travell, and Simons 1999). Metabolic, genetic, and glandular disorders can perpetuate trigger points, as can psychological issues and numerous physical considerations.

Physical Factors

Some of the physical factors that can contribute to the perpetuation of trigger points are postural stress, widespread hypermobile joints that stretch farther than normal, scoliosis, poor work habits, repetitive strain, lack of exercise, large breasts, muscle imbalances, and congenital irregularities in bone structure.

Abnormal Bone Structure

Some people are born with a bone abnormality that can become a trigger point perpetuator. A short leg, an asymmetrical pelvis, short upper arms, and a long second metatarsal bone in the foot are often found to be the source of persistent problems with recurrent myofascial pain. Abnormal bone structure can make it necessary for the body to continuously compensate, resulting in perpetual strain on particular groups of muscles. Unequal leg length may create and maintain trigger points in the legs, buttocks, back, and neck. Unless corrected by a heel lift, pain may persist or recur in these areas. Using an appropriate heel lift has even been known to stop intractable headaches (Simons, Travell, and Simons 1999). Unfortunately, leg length is difficult to measure accurately unless done by X-ray. Chronically tight muscles can add to the difficulty by causing the appearance of a short leg. It is worth it to find a doctor, physical therapist, or chiropractor in your area who is specifically trained in detecting and correcting a structural leg length inequality. A temporarily long leg caused from wearing a walking cast can wreak havoc on your back. In this case, you'd want to wear a shoe on the unaffected foot with a sole as high as the walking cast.

Sometimes, an entire side of the body is smaller than the other. In such cases, one side of the pelvis is likely to be smaller too, which makes your pelvis tilt while sitting. This causes the spine to curve abnormally, placing an

extra load on the quadratus lumborum and other back muscles. The effect can be transmitted as far away as the sternocleidomastoid and scalene muscles of the neck. Crossing your legs with the same leg over the other all the time may indicate that you're compensating for an asymmetrical pelvis. Sitting on a pad, magazine, or thin cushion under the smaller side of the pelvis can help remedy this condition (Simons, Travell, and Simons 1999).

Short upper arms are more common than you might think, and they aren't usually recognized as a potential cause for lingering myofascial pain (Simons, Travell, and Simons 1999). When you have short upper arms, you need higher arms on your chairs. Lack of support for your elbows causes continual strain on the muscles of the neck, upper back, and low back. Add a layer or two of rubber foam to your desk and favorite armchairs and the armrest of your car.

Morton's foot, an easily corrected disparity in the length of the first and second metatarsal bones of the foot, is known to be the origin of a variety of aches and pains. The instability in the foot and ankle caused by this condition can affect virtually the entire body and may often be the underlying cause of Achilles tendinitis (Simons, Travell, and Simons 1999). Read about the correction for Morton's foot in chapter 10, Lower Leg, Ankle, and Foot Pain.

Certified myofascial trigger point therapists and some neuromuscular therapists are trained in detecting these structural perpetuation factors. There are not many of them around, but it is worth finding one close to you. See the Resources section for a number of websites listing trained therapists.

Postural Stress

Strained or awkward positions in your work situation can cause trigger points and make them hard to get rid of. The apparent comfort and familiarity of a longtime habit can make you unaware of its effects on your muscles. It's wise to examine how you sit, stand, lift, and work in order to find the ways in which you may subject certain muscles to continuing tension and strain. Observe whether you're keeping your head turned or cocked at an angle for long periods of time. Propping the phone between your shoulder and ear puts great stress on your upper back and neck muscles. Use a headset or hands-free device whenever possible. Develop an awareness of unusual tightness in muscles that might indicate postural imbalance.

Trigger points can be caused and perpetuated by ill-fitting furniture such as couches and chairs and the bucket seats in cars, all of which can strain muscles by failing to properly support the body. You may be so accustomed to these strains that you have learned to live with them.

Another factor that may perpetuate trigger points without ever rising to the level of consciousness is the constriction of muscles by a bra, necktie, purse strap, backpack, hat, belt, shoe, or even sock. Any muscle that's deprived of a free flow of blood and oxygen is apt to develop trigger points, and a continuing restriction will keep the trigger points going. You may have heard of the type of sciatica caused by carrying a fat wallet in the back pocket. This restricts circulation in certain buttock muscles and perpetuates trigger points that cause the muscles to pinch the sciatic nerve, causing pain and numbness in the leg. Trigger points generated in the trapezius muscle by a backpack, taut bra strap, or heavy purse on a shoulder strap can be the unsuspected source of chronic neck pain and headaches (Simons, Travell, and Simons 1999).

A sedentary lifestyle is both a cause and a perpetuator of trigger points. Muscles need to work in order to stay healthy. Keeping them immobile or inactive encourages them to stiffen and shorten and makes their trigger points resistant to therapy. Poor posture in general, characterized by slumping with your head, neck, and shoulders forward, is also a perpetuator, making it hard to resolve myofascial pain in these areas (Simons, Travell, and Simons 1999).

Vitamin and Mineral Insufficiencies

Trigger points are aggravated by anything that cuts the supply of energy to your muscles, including deficiencies and insufficiencies of essential vitamins and minerals. Travell and Simons were convinced that nearly half the patients they treated for chronic pain were lacking certain vitamins or minerals necessary for balanced muscle metabolism (Simons, Travell, and Simons 1999). The term "insufficiencies" is used to indicate levels that are lower

than normal, but they may not be considered clinically important to physicians who are not familiar with myofascial pain. These critical nutrients include the water-soluble vitamins B1, B6, B12, C, and folic acid. Lack of vitamin D also plays a significant role in chronic pain (Dommerholt, Bron, and Franssen 2011). The minerals calcium, iron, magnesium, potassium, and zinc are also critically important. Groups of people especially likely to be deficient in these minerals are the elderly, pregnant women, dieters, the economically disadvantaged, the emotionally depressed, and people who are seriously ill.

The problem in many cases may not be inadequate intake of vitamins and minerals, but consuming other substances that cause their elimination. Smoking destroys vitamin C. Alcohol, antacids, and the tannin in tea impair absorption of B1. Antacids can also affect absorption of calcium and folic acid. Oral contraceptives leave you short of vitamins C and B6, as do antitubercular drugs and corticosteroids. Consumption of caffeine also perpetuates trigger points. Also be wary of overdoing a good thing. Too much vitamin C or folic acid can deplete your B12.

Levels of the minerals calcium, magnesium, iron, and potassium must be adequate for muscles to function normally. The exchange of calcium ions is directly involved in the contraction and relaxation of muscle fibers. Magnesium is needed in conjunction with the body's use of calcium, and low levels of magnesium are associated with muscle hyperexcitability (including twitching, cramping, tension, and pain) and weakness. Iron enables muscle tissue to use the nutrients and oxygen delivered by the blood. Iron also has a role in regulating body temperature. People with inadequate iron may feel cold much of the time. Too much iron, however, is as bad as too little, sometimes leading to skin discoloration, heart disease, and slow recovery from stroke. Potassium deficiency affects the functioning of heart muscles and other smooth muscles (Mense and Gerwin 2010).

If your trigger points persist or you have recurring bouts of muscle pain, it is a good idea to get blood work done to test for insufficiencies. See table 2.1 below for suggested levels of important vitamins and minerals.

Table 2.1 Useful Lab Tests

	Men	Women
	<i>Your clinical test results should be at or greater than these values:</i>	
Ferritin (a storage form of iron)	50 ng/ml	50 ng/ml
Vitamin B ₁ (thiamin)	4.0 mcg/l	4.0 mcg/l
Vitamin B ₆	5.4–6.7 mcg/l	2.0–2.8 mcg/l
Vitamin B ₁₂	350 pg/ml	350 pg/ml
Vitamin D	32 ng/ml	32 ng/ml
Serum folate	5.4 mg/ml	5.4 mg/ml
	<i>Your clinical test results should be within these ranges:</i>	
Serum calcium	8.5–10.6 mg/dl	8.5–10.6 mg/dl
Serum magnesium	1.8–3.0 mg/dl	1.8–3.0 mg/dl
Serum potassium	3.5–5.2 mmol/l	3.5–5.2 mmol/l
Vitamin C	0.4–2.0 mg/dl	0.4–2.0 mg/dl

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Metabolic Disorders

You're likely to have trouble getting rid of your trigger points when any chemical or glandular imbalance interferes with metabolism in the muscles. Some conditions to watch out for are hypothyroidism, low testosterone, low estrogen, hypoglycemia, anemia, prolonged breastfeeding, and high levels of uric acid in the blood (*uricemia*).

Nicotine, caffeine, and alcohol cause enough irregularity in metabolism to make it difficult to keep trigger points deactivated (Simons, Travell, and Simons 1999).

Low output from the thyroid gland (hypothyroidism) can increase the irritability of muscles, predisposing them to development of trigger points and making relief from trigger point therapy very short-lived. Typical signs of hypothyroidism include muscle cramps, weakness, stiffness, and pain. Other symptoms are chronic fatigue, inability to tolerate cold, dry skin, hyperactivity, disturbed menstruation, and trouble losing weight. Lithium appears to lower thyroid secretion, while estrogen replacement increases it. This means that, indirectly, lithium may make your trigger points worse and estrogen may make them better (Simons, Travell, and Simons 1999; Sonkin 1994; Bochetta et al. 1991).

Recurrent bouts with hypoglycemia (low blood sugar) tend to aggravate trigger points and decrease the effectiveness of trigger point therapy. Symptoms of hypoglycemia are a fast heartbeat, sweating, shaking, and increased anxiety. A more severe spell can bring visual disturbances, restlessness, trouble with thinking and speaking, and even fainting. Emotional distress makes you more susceptible to hypoglycemia. Caffeine and nicotine both accentuate the secretion of adrenaline, which can worsen this condition. Alcohol, even in moderate amounts, can keep your liver from producing glycogen and make you hypoglycemic while the alcohol is in your system and sometimes for a day or two afterward (Simons, Travell, and Simons 1999; Foster and Rubenstein 1980).

Uricemia can make your trigger points more troublesome. Gout, the deposit of urate crystals in the joints, is the extreme manifestation of this problem. A diet of too much meat and too little water is likely to promote uricemia. Vitamin C helps combat the problem (Simons, Travell, and Simons 1999; Kelley 1980).

Psychological Factors

Tension, anxiety, chronic depression, and common nervousness can make trigger point therapy ineffective. So can “good sport syndrome,” wherein you insist on working or playing through the pain. On the other hand, hypochondria or a sense of hopelessness can handicap your immune system, lower your resistance, and make you unresponsive to trigger point therapy (Simons, Travell, and Simons 1999).

Cultivate an awareness of when you’re holding rigid postures and how this relates to your emotional state. You may breathe shallowly when things aren’t going well. You may even hold your breath at times. If you tune in during tense moments, you’ll detect where you hold tightness in your body. Emotional distress can often be reduced by simply relieving needless or excessive muscle tension. To cope effectively with habitual muscle tension, it is useful to take an organized approach. Learn *progressive relaxation*, a method for systematically relaxing your body one part at a time. You can find out more about a unique system of progressive relaxation in chapter 12, Muscle Tension and Chronic Pain.

Other Factors

A number of other influences may affect your success with trigger point therapy. Chronic bacterial infections, including an abscessed tooth, sinusitis, and urinary infections can keep trigger points going, as can viral diseases like influenza and herpes simplex virus type 1. Lack of sleep or sleep that isn’t restful can also be a perpetuator of trigger points.

An allergy to airborne irritants that causes respiratory distress can make it very difficult to keep up with trigger points in the neck, chest, and stomach. Food allergies can make all the body’s muscles more vulnerable to stress. Parasitic infestation of the intestinal tract can perpetuate trigger points indirectly through depletion of essential nutrients. Infestations can be insidious and may be more common than you think (Simons, Travell, and Simons 1999).

You can't depend solely on control of perpetuating factors to get rid of trigger points and myofascial pain. You will likely still have to do your self-applied massage. You may happen onto the one factor that makes all the difference in solving your current pain problem and preventing future ones.

Taking Action

Many causes of trigger points may be difficult to eliminate or change. The inescapable repetitive motion in a work situation is a perfect example. Be assured that regular self-treatment of trigger points can help keep the deleterious effects of repetitive motion at bay. The next chapter will introduce you to the techniques of self-applied trigger point massage. You'll be astounded at how simple and effective trigger point massage can be.

Chapter 3

Treatment Guidelines

Although professional treatment is undoubtedly a great way to treat trigger points, there are many advantages to self-applied massage. With self-treatment, you don't have to wait for an appointment, you can get help whenever you need it, and you don't pay a cent. Best of all, you don't have to depend on someone else knowing what's causing your pain and knowing what to do about it. You can be the expert.

No one can ever have the connection with your pain that you have. You know exactly where it hurts and how much it hurts. You know better than anyone else when a treatment feels right and when it doesn't. With self-applied trigger point therapy, you'll have direct control over treatment. Most people feel a satisfying sense of empowerment when they discover they know how to get rid of their own pain.

It's important to realize that self-treatment won't all be smooth going. There will be some difficulties to surmount. You can make some kinds of pain go away very quickly, but a long-established chronic problem can take a couple of months to clear up. This is because trigger points that have been in place for a long time have made pathways in the nervous system that tend to reinforce and perpetuate them (Simons, Travell, and Simons 1999; Yaksh and Abram 1993). You may also have long-term postural dysfunctions, structural variations, or nutritional deficiencies that perpetuate your trigger points. (*Postural dysfunction* is when your habits, such as sitting slouched at your computer, cause one group of muscles to be chronically shortened, putting joints, including the spine, out of their normal balanced alignment. These shortened muscles will adapt to this shorter position and create muscle imbalances that are sustained even when you are not doing the habitual posture.)

Another reality is that trigger point massage can hurt, though if done correctly, it will be a pleasant kind of discomfort, a level of discomfort you can still relax into. The goal should be to make the level of pressure you use “therapeutically delicious” or “exquisitely tender.” If it hurts too much, you might avoid doing it. If you try too hard to make massage work and do too much of self-treatment, your body will react against it and make your pain worse for a day or two. Overenthusiastic or excessive use of hard tools for massage can result in bruising not only of the skin but possibly also of deeper tissues, such as muscles and nerves. When you have a lot of very active trigger points and work too long on yourself, you can come out of it feeling woozy or nauseated. If you have widespread pain, don't try to take care of everything at once. Work on your worst problems first and try to be patient with the method and with yourself. Start with the decision to devote two weeks to this therapy. Read the first three chapters, identify your three or four most likely and important muscles from chapters 4 through 10, and do daily self-treatment starting at three sessions a day. It won't take that much time. At the end of the two weeks, re-evaluate. If you see some improvement, keep going! If not re-read the section “No Results: Why?” in this chapter.

Also, recognize that some of the trigger points related to your greatest stresses will tend to be recurrent. It's not reasonable to expect that you'll never have pain again. Nevertheless, by developing your skills at trigger point massage therapy, you'll be better equipped to cope with pain than ever before. Plan to be good at trigger point self-treatment and it will be a new life skill.

Troubleshooting: How to Find the Source of Pain

Success with trigger point massage depends ultimately on your ability to recognize when your pain is referred pain and to trace it back to the trigger point that is causing it. It's too easy to get caught up in attacking the pain itself and remaining blind to its cause. Although some trigger points cause local pain, it's a mistake to assume that the problem is at the place that hurts. Winning over pain requires giving considerable attention to the referred pain patterns.

It's a mistake to assume the problem is at the place that hurts.

At the beginning of chapters 4 through 10, you will find a Pain Guide and an Other Symptoms Guide. These guides list muscles that are known to send pain to particular sites. To find the specific trigger point that causes pain at a particular location, check the muscles on the appropriate list one at a time. The Pain Illustrations Guide, also at the beginning of each muscle chapter, can help you quickly identify which muscles to learn more about. Look at the drawings and read the description of symptoms to see which pain patterns match yours. We chose to simplify the drawings of referred pain to just the most intense and most common parts of the pattern—in other words, the primary pain pattern. The “spillover” pain, or less common pain, is described in the text. In the Pain Guide, the words in bold type show muscles with primary pain patterns. The muscle names in regular type have a spillover pain pattern for that area. Always allow for the possibility that a muscle low on the list may be the culprit. It's not unusual for trigger points in several muscles to be contributing to the problem. The page number follows the muscle name. The Pain Guide, Other Symptoms Guide, and Pain Illustrations Guide (referred pain drawings) are adapted from *Myofascial Pain and Dysfunction: The Trigger Point Manual* (Travell and Simons 1992; Simons, Travell, and Simons 1999). It's useful to know the right names for the muscles. Knowing the name of the muscle helps clarify your conception of where it is and makes it easier to find. You certainly have to be able to find the muscle before you can find its trigger points.

Learning about Body Mechanics

In the muscle chapters, you'll learn about the job each muscle does. Understanding a muscle's function helps you find the trigger points that are causing your problem. Insight into body mechanics also lets you see what you can do to prevent the problem from recurring. Simply getting rid of the pain is rarely enough. More than anything else, you need to know how you can keep it from coming back.

When you know your muscles and have gained some experience finding their trigger points, you'll find your hands going right to them without having to consult the charts. Being aware of your body and understanding how the muscles work also increases your awareness of problems when they're just starting up. This helps you nip trigger points in the bud.

Finding Trigger Points

False assumptions about the source of your pain can defeat your every effort to get rid of it. Pain referral is the essential fact about trigger points. Massage in the wrong place can feel good and yet do no good at all. It can even make your pain worse. You won't conquer referred pain unless you get good at tracking it to its source. The illustrations of the referred pain patterns for each muscle are the key to finding trigger points. Figure 3.1 shows how muscles, trigger points, and referred pain are indicated in the illustrations. An area of referred pain is portrayed by a group of parallel lines running diagonally from lower left to upper right. Parallel lines also represent a muscle, but the lines are always enclosed within the outline of the muscle. A black dot approximates the location of a trigger point and may stand for several trigger points in the area. To keep the illustrations simple, trigger points are usually shown on only one side of the body, but they can occur on either side or both. Trigger points typically cause pain on the same side of

the body where they are located. Rarely do they send pain to the opposite side. You'll notice a tendency for trigger points to send their pain away from the center of the body, but the reverse is occasionally true, too.

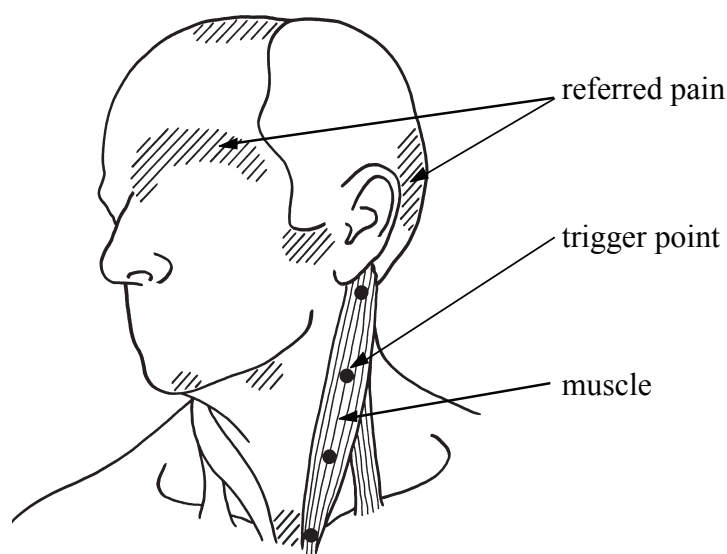


Figure 3.1 Key to pictorial devices. It is possible to have only part of the referral pattern. Additional, less common referral patterns are noted in the Pain Guide, Other Symptoms Guide, and the text.

Sometimes an illustration will put you exactly on target, and sometimes it will only get you in the ballpark. Ultimately, you have to zero in on trigger points by sensation. The aim is to get to the right area and then search for that spot of exquisite tenderness. Don't be discouraged if you can't feel the little nodules in the muscles. Typically, trigger points feel like tight areas of muscle rather than three dimensional knots. They are in the most intense area of tenderness in an area that feels good to massage. Sometimes you won't know if you've found the right spot until the symptom is relieved. The most reliable criterion for detecting a trigger point is its extreme tenderness. Just seek the spot that hurts the most when you press on it. Obviously, many medical conditions cause tenderness in muscles and other soft tissue. The first key is to notice if you are able to keep the discomfort at a moderate level with gentle massage. A trigger point should get less tender with successive treatments. If the symptom does not improve and the

point is not getting less tender, you should check with a physician, preferably one who is informed about trigger points and myofascial pain.

Contraindications: Reasons to Be Cautious

There are a few reasons to be cautious with deep stroking massage. Here is a rule to live by: never massage a pulse. Arteries supply fresh blood to the various organs and parts of the body. They also tend to accumulate plaque. To avoid loosening plaque and sending it to places you don't want it to go, like your brain, avoid massage to large arteries. You will find trigger points near but not on the carotid artery on the front of the neck, the descending aorta in the abdomen, and the femoral artery near the groin on the thigh. To address muscles in these areas, simply find the pulse first with the gentle touch of your fingertips, and then move to the side of the pulse to avoid the artery. Specific instructions for each endangerment zone are included with each muscle if needed. If you have been diagnosed with atherosclerosis, it's advisable to get a doctor's permission before doing any type of massage.

Another common concern is the lymph system. While doing massage, you may find swollen lymph nodes. When they are healthy, lymph nodes are much smaller than a pinto bean. It is likely that you won't even feel them at all. They can feel firm or hard and tender when inflamed or enlarged. If you do feel them, avoid pressing or pinching them. They are not encased in muscle tissue and are nearly impossible to pinch with two fingers. Avoid the lymph nodes themselves and apply conservative massage to the muscles nearby that you are seeking to treat. The lymph system fights infection, fungi, viruses, bacteria, and cancer. If you feel a lymph node that is swollen for more than a couple of days, see a doctor. If you have a compromised lymphatic system due to breast cancer surgery, for example, you may need to consult a lymphatic drainage specialist or a massage therapist trained in lymph drainage before pursuing extensive massage therapy. They can teach you simple self-care techniques to use before and after doing deeper trigger point massage.

Trigger points are usually shown on only one side of the body, but they can occur on either side or both.

There are many other conditions that would contraindicate massage therapy, including trigger point massage. This list includes the obvious, such as fever, skin infection or contact dermatitis, acute systemic infection such as a virus, or kidney failure. There are many serious health conditions you'd want to consult your doctor about before doing massage. A brief list of examples includes aneurysm, atherosclerosis, cancer, congestive heart failure, coronary artery disease, peritonitis, or polycystic kidney disease. Other conditions that are contraindicated for massage therapy include fever, cirrhosis, pitting edema, blood clots, broken bones, deep vein thrombosis, embolism, fainting, uncontrolled high blood pressure, intestinal obstruction, lymphangitis, myocarditis, rheumatoid arthritis, tumors, seizures, and tuberculosis, just to name a few (Werner 2013).

Some of these conditions have to do with the movement of fluids and substances through the body. Massage increases circulation; trigger point massage does the same on a smaller scale. It is always wise to check with your physician to ensure that your body can tolerate deep tissue massage successfully. A few books and websites listed in the Resources section offer additional information.

Massage Technique

When it comes to doing massage the right way, there are two overriding issues: safety and effectiveness. You have to be able to do massage without straining and exhausting the muscles in your forearms and hands, and you have to do it in a way that will actually have an effect on a trigger point.

Table 3.1 lists nine principles of safe, effective, self-applied trigger point massage. These guidelines define the basic massage stroke that is used everywhere on the body. Massage of each trigger point should be relatively brief, less than a minute. That constitutes a treatment. It's not necessary to do more. It's best to move on to the next trigger point. Excessive treatment can be counterproductive. A basic tenet of medicine is that you can only create conditions that promote healing. The body itself is the healer. You must trust your body's natural processes to respond and do their job.

Don't try to force a release. Trigger points release on their own when they get frequent daily treatment that follows the guidelines given below. Be patient—you will be surprised at how well this simple routine works. Treatment failures are usually the result of being too aggressive or simply treating the wrong spot.

Treatment failures are usually the result of being too aggressive or simply treating the wrong spot.

The guidelines here are especially useful for people who are doing self-treatment without the guidance of a knowledgeable therapist. It is much better to be conservative with treatment and see consistent, gradual improvement than be too aggressive and cause a temporary pain crisis. We've made these guidelines available for download at www.newharbinger.com/24946 so you can carry them with you. (See back of book for more information.)

Table 3.1 Self-Massage Guidelines at a Glance

1. Use a tool if possible and save your hands.
2. Use deep stroking massage.
3. Massage with short, repeated strokes from one side of the painful spot to the other.
4. Do the massage stroke in one direction for best ergonomics.
5. Do the massage stroke slowly.
6. Aim at a pain level of 5 on a scale of 1 to 10.
7. Limit massage to ten to twelve slow strokes per trigger point.
8. Work a trigger point three to six times per day.
9. If you get no relief, you may be working the wrong spot.

Deep Stroking Massage

The traditional approach to manual trigger point therapy is called *ischemic compression*: you press and hold trigger points for a specified number of seconds, or until they release. You literally squeeze the blood out of the tissue. The trouble with pressing and holding a trigger point is that it can become unnecessarily painful if the goal is to make it release. It also requires a sustained contraction of the shoulders, arms, and hands of the person doing the therapy, which can become extremely tiring in a very short time. Fortunately, there's an equally effective way to deactivate trigger points.

Instead of the static pressure of ischemic compression, **make a series of strokes across the trigger point nodule.** This gets good results with less irritation to the trigger point, less damage to your hands, and less risk of bruising the skin and muscle. Compressing the trigger point is the right idea, but a repeated “milking” action may move the blood and lymph fluid out more efficiently. The lymph contains the accumulated waste that has been generated by the continuously contracted muscle fibers. Picture how you rinse out a dirty cloth. Wetting and wringing it out only once won't get it clean, no matter how long and hard you twist it. You need to run fresh water through it over and over until the water wrings out of it clear. A similar process works with a trigger point.

Another advantage of using the short, repeated stroke instead of static pressure is that intermittent pain is easier to tolerate than continuous pain. Intermittent moving pressure allows you to go deeper and evoke just a little more pain than you could stand than if you just pressed a trigger point and held it. Work deeply and slowly, using very short strokes, and no more than one stroke per second. It only needs to move from one side of the painful spot to the other. Rather than sliding your fingers across the skin, move the skin with the fingers. This will help free up the underlying fascia, the thin membrane that envelopes muscles and whose tightness is sometimes part of the problem. Work at your level of tolerance, pressing the trigger point toward or against the underlying bone. Release the pressure at the end of the stroke, go back to where you started the stroke, and repeat. Each time you release the pressure, fresh blood flows in, bringing fresh oxygen and nutrients. The trigger point has been deprived because pressure from the knotted-up muscle fibers has been constricting the capillaries that supply them with these essential substances. Although you'll hear that you should always move the fluid toward the heart, it's not a critical issue here because so little fluid is being moved. Stroke in whatever direction feels best. Change directions in the middle of the treatment if you want, paying attention to your ergonomics. Find the easy way, or it will wear you out and you won't want to do it.

Find the easy way.

Another benefit of the deep stroking massage is that it helps get the stretch back into the muscle fibers within the trigger point. Picture what would happen if you applied deep stroking massage to a ball of modeling clay. It would spread and lengthen in the direction you pushed it. The effect on the muscle fibers is similar, just not as dramatic or as visible. Think of this as a microstretch, as opposed to the macrostretch of the whole muscle that you do with conventional stretching exercises. The microstretch is applied directly to the trigger point, right where it's needed most. Done this way, there's little chance of overstretching the taut bands of muscle fibers that lead from each side of the trigger point to the muscle's attachments at the bone. Overstretching this taut band risks irritating the trigger point and keeping it contracted.

There are many different ideas about how to treat a trigger point. The right idea seems to be to do what feels best to the person receiving the treatment. What feels right may vary from session to session or even from muscle to muscle. Treat the individual as an individual. Do what reduces pain and restores function, and does not create more problems, or strain the person applying the therapy. Try different ways. Our guidelines will help you get started.

There are many different ideas about how to treat a trigger point. The right idea seems to be . . . to treat the individual as an individual. Do what reduces pain and restores function, and does not create more problems, or strain the person applying the therapy.

Therapeutically Delicious: A Guide to How Much Pressure to Use

Trigger points hurt when compressed, and you may be very reluctant to work them for fear of doing yourself harm or making your pain worse. Rest assured that self-administered pain is usually self-limiting. Your natural defense mechanisms won't allow you to inflict more pain on yourself than you can stand. It's very unlikely you'll do yourself real harm unless you try to massage too deeply or too long with hard tools (Simons, Travell, and Simons 1999). Be sure to read the section about reasons to avoid massage under "Contraindications" above.

The level of discomfort caused by massage is useful as a measure of effectiveness. To gain maximum benefits, you should exert enough pressure to make it "therapeutically delicious." It should be a pleasant kind of pain. Aim at a pain level of 5 on a scale of 1 to 10, where number 1 is no pain and number 10 is intolerable. In earlier editions of this book, we advocated a higher level of discomfort on the pain scale. I have since come to appreciate the effectiveness of being able to relax during the treatment. If you are grimacing or holding your breath, you are pressing too hard. Sometimes less is more.

Using the number scale, continue multiple daily treatments of the trigger point until your pressure on it elicits a pain level of only a 2 or 3. Don't expect to reach this goal in a single session. Use short, repeated sessions and let the body do its job in between. You should continue massage for several more sessions after the trigger point has stopped actively referring pain. Latent trigger points continue to keep the muscle short and vulnerable.

Saving Your Hands and Fingers: Tools to Use

Considering the risks inherent in overworking your hands and fingers while doing self-applied massage, it's smart to avoid using them if at all possible. You may not have thought of using your knuckles, knees, heels, or elbows as massage tools, but it can be done. See figures 6.7, 10.7, and 10.27.

There are also a number of commercially available massage tools that are ergonomically designed to maximize safety and efficiency. Tools aren't appropriate, however, in sensitive areas such as the front of the neck. When there's no other choice but using your fingers, you must do all you can to avoid injuring them.

The basic principle in using your hands for massage is to apply the most force with the least amount of effort. When a thumb is used as a massage tool, back it up with the fingers (figure 3.2); this is called the *supported thumb*. Don't use the thumb in opposition to the fingers unless there is simply no other way to do it. Gripping or kneading would seem the most natural thing to do, but it is actually quite exhausting. Save the grip for places where nothing else will do.

When using your hands as massage tools, pair them, if you can, using the opposite hand to back up the fingers that are doing the massage (figure 3.3). This tool is called *supported fingers*. The single hand shown in the drawing illustrates how the wrist, hand, and fingers are kept straight and yet as relaxed as possible. This takes the hand and forearm muscles largely

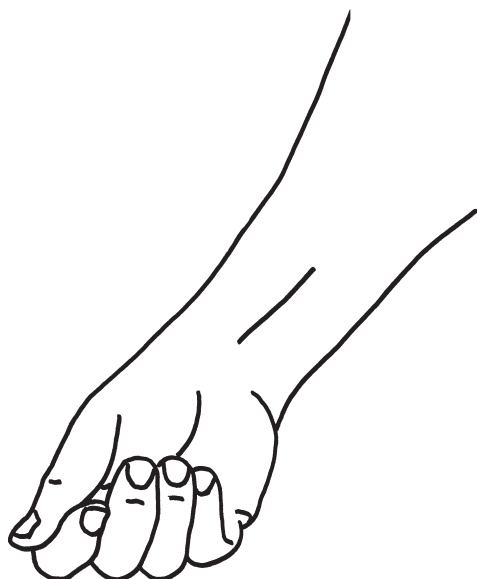


Figure 3.2 Supported thumb

out of the equation, requiring the force to come from larger muscles of the shoulders, chest, and upper back. This makes a very pointy tool that penetrates with minimal effort. Observe that the supporting hand completely covers the nails. The ulnar side (pinky side) of the hand should make contact with the skin of the place being worked on. Note that the supporting hand helps move the fingertips of the tool hand.



Figure 3.3 Supported fingers. (Note that the supporting hand completely covers the nails of the massaging fingers. Both hands work together in making the massage stroke.)

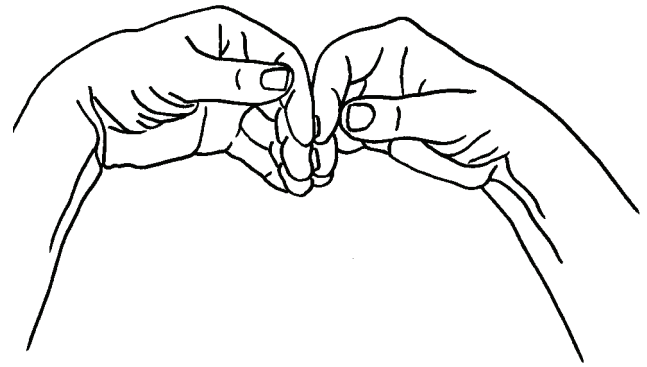


Figure 3.4 Supported fingers back-to-back

Figure 3.4 illustrates a subtle way to support the fingers back-to-back for self-applied abdominal massage. Other ways to position the hands to give support to the fingers are shown in figures 7.7, 7.24, and 10.25.

Rather than using the hand to pinch, squeeze, and knead, use the thumb or fingers like the end of a stick to push into the flesh. For the greatest mechanical advantage, the fingers or thumbs need to be held nearly perpendicular to the surface of the body (figure 3.5). This allows the force to be directed in a straight line from the elbow down through the arm, wrist, and hand and out the ends of the fingers or thumbs. You'll see right away that if you have fingernails of even moderate length, you will be prevented from using your hands in this way.

Massage done with the flats, or pads, of the fingers is ergonomically so poor that you'll find your hands and fingers getting tired before you've gained much benefit. In some lines of work, the inefficiency imposed by long nails contributes significantly to formation of trigger points in the forearms and hands because the muscles have to work so much harder to overcome the awkwardness. Professional massage therapists keep their nails filed to the quick. You might consider doing the same, at least until your trigger points are gone.

If you feel that you can't do without your nails, try using supported knuckles, as shown in figure 3.6. Note that the "door knocking knuckles" of your third and fourth fingers are the tool. Your wrist and biggest knuckles, or "fighting knuckles," are kept straight to efficiently transfer force from the shoulders. Supported knuckles are in fact a power tool and are rather blunt as opposed to supported fingers, whose best use is very precise massage requiring deep penetration.

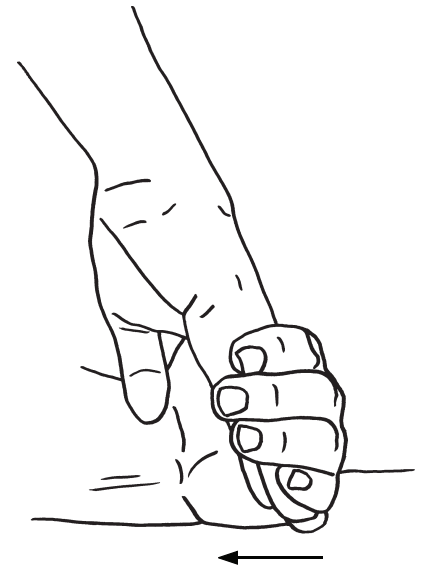


Figure 3.5 Supported fingers nearly vertical to skin



Figure 3.6 Supported knuckles

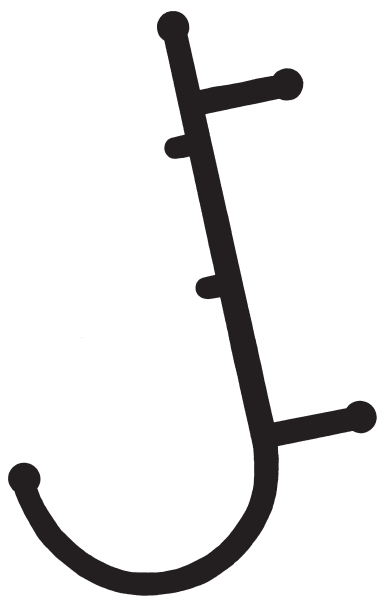


Figure 3.7 Thera Cane

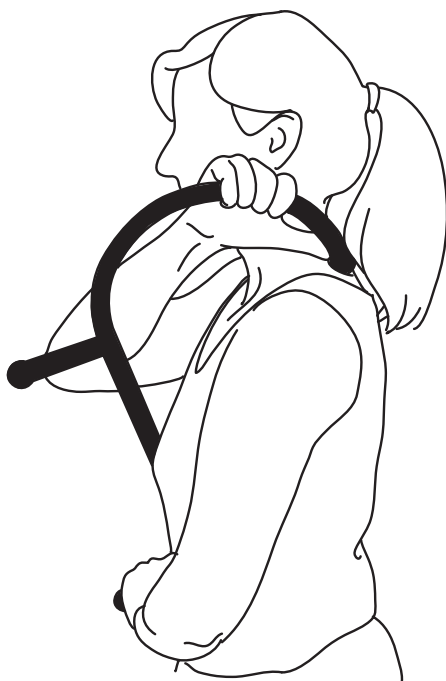


Figure 3.8 Massage using the Thera Cane with opposite hand in the bow

A great variety of massage tools are available that will save your hands, amplify your strength, and let you reach difficult places. There are many well-designed tools including the Thera Cane (figures 3.7 and 3.8), the Backnobber (figures 3.9 and 3.10), the Body Back Buddy (figure 3.11), the Knobble (figure 3.12), and the Shemala tools (figure 3.13). All of these items, along with many other useful tools, are available online or through many massage therapists. Web addresses and phone numbers of distributors can be found in the Resources section at the end of the book. There are many variations of the hook-style tools. The Thera Cane is the most versatile, while the Backnobber has a small penetrating knob and comes apart for

travel in a carry-on bag. A new travel version of the Thera Cane is available, too. The Body Back Buddy has a couple of versions; the one shown in figure 3.11 is slightly larger than the other two and sports a couple of pointed knobs for deeper pressure. Pressure Positive, the maker of the Backnobber, has a variation for bigger bodies called the Big Bend Backnobber. In most illustrations in this book, you'll see the Thera Cane, but all of these tools work well. In many of the drawings, you will see the Thera Cane being applied to bare skin. This was done for the sake

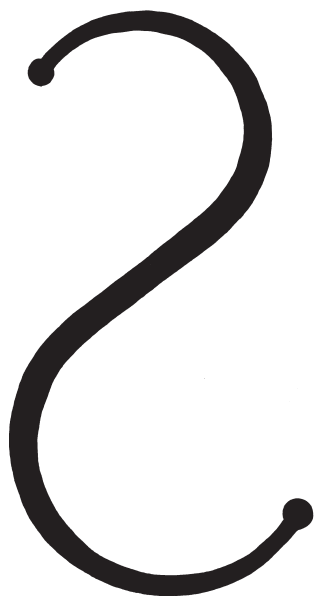


Figure 3.9 Backnobber



Figure 3.10 Using the Backnobber

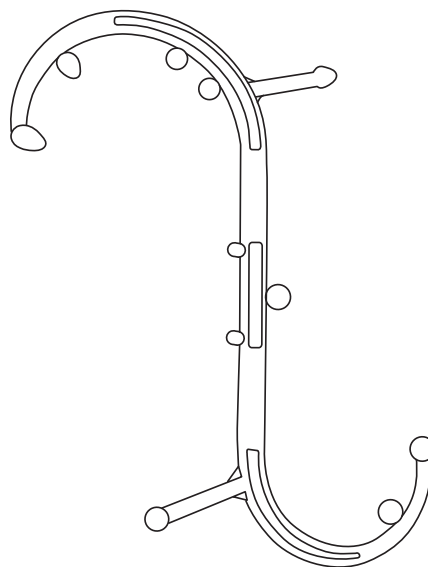


Figure 3.11 Body Back Buddy

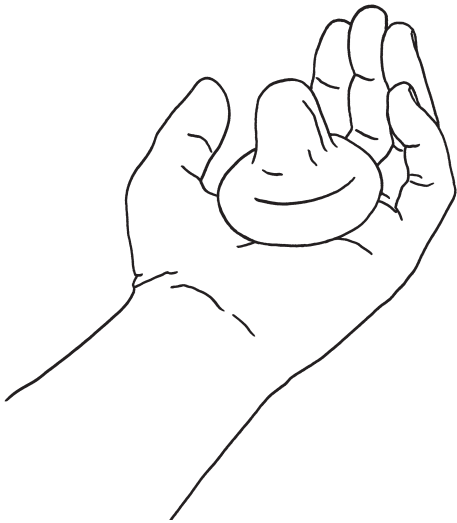


Figure 3.12 The Knobble

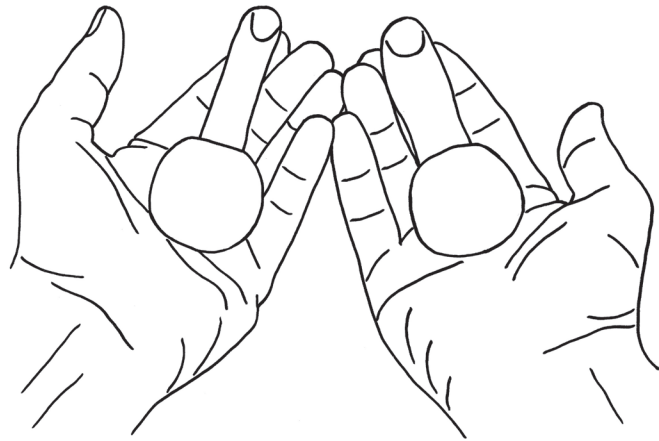


Figure 3.13 Shemala Fingers—the index finger shown on the left and the thumb on the right

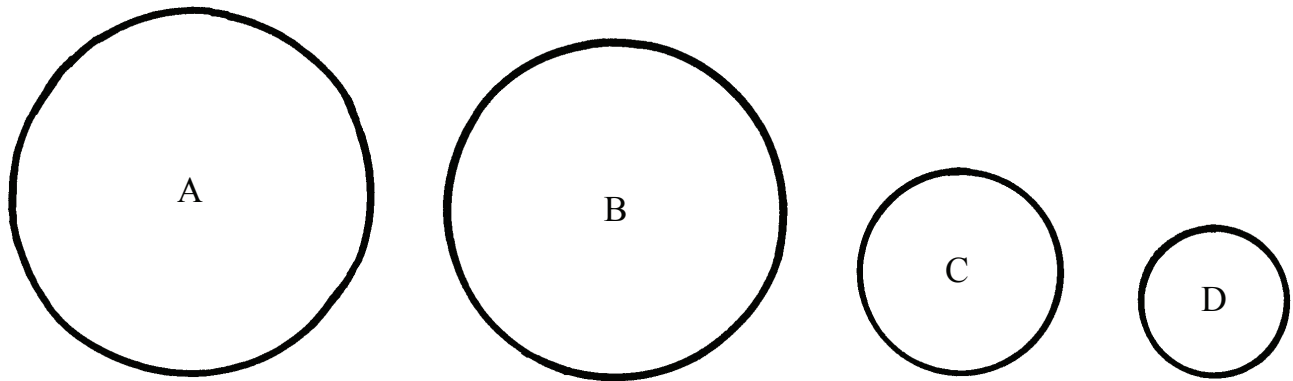


Figure 3.14 Balls for massage against a wall: (A) tennis, high bounce, or lacrosse ball (60–64 mm); (B) high bounce (45 mm); (C) high bounce (35 mm); and (D) high bounce (24 mm). Balls not shown actual size.

of clarity: you won't like it on bare skin. For comfort and to avoid abrasion and bruising, massage tools should be used through a layer of clothing.

The best massage tool of all for a surprising number of muscles may simply be a ball pressed between the body and a wall (figure 3.15). You can use a tennis ball or a hard rubber ball of the same size; smaller rubber balls can be used if you need to go deeper. Putting a tennis ball in a sock or long panty hose lets you hang the ball down behind your back without risk of dropping it or losing control over its placement (figure 8.6). The sock is a convenient handle that helps you get the ball into position. “High bounce” or “super bounce” rubber balls can sometimes be found in sports, discount, and variety stores. They're hard without being too hard, and they make excellent massage tools. Figure 3.14 shows the relative size of balls used for massage of various places. The tennis, lacrosse, and high bounce balls range from 60 to 64 mm sizes (letter A). These are meant to be used on the arms, shoulders, chest, hips, legs, back, and buttocks against a wall. The 45 mm high bounce ball (letter B) is useful to sit on to massage the buttock and pelvic floor muscles or to massage small forearms against a wall. The 35 mm ball (letter C) is for the

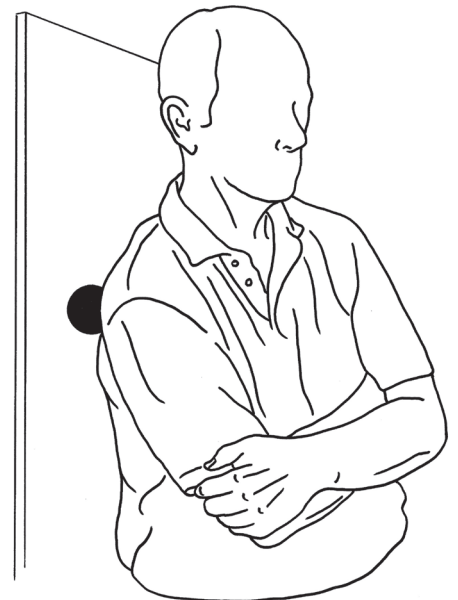


Figure 3.15 Massage with a rubber ball against a wall

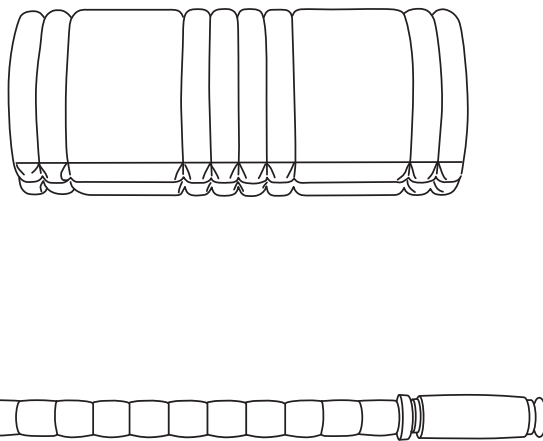


Figure 3.16 The foam roller and The Stick

bottom of the feet against the floor or beside the spine against a wall. The 24 mm ball (letter D) is for the hand and base of the thumb against a wall. (A detailed description of how to use the ball-against-a-wall technique is included in chapter 8 under the treatment section “Superficial Spinal Muscles.”) A problem with high bounce balls is that they are seasonal toys and often can’t be found anywhere in the fall and winter. Sometimes you can find solid rubber dog balls where you shop for pet supplies. Online sources may be your best bet for large high bounce balls. The High Bounce Pinky is a dense foam ball that is slightly softer than the rubber high bounce ball but harder than the tennis ball. It is rubberized on the outside and doesn’t need a sock like a slippery tennis ball. It can be found on many websites. The most intense tool for massage against a wall is a lacrosse ball, which is very hard and durable, and can be found in all seasons in large sporting goods stores. You may like a lacrosse or high bounce ball better than a tennis ball because it will penetrate with less effort and doesn’t slide around on the wall. See the Resources section at the back of the book or go to www.triggerpointbook.com to purchase a package of all of the massage balls mentioned here.

A detailed description of how to use the ball-against-a-wall technique is included in chapter 8, under the treatment section “Superficial Spinal Muscles.”

Other massage tools you may find useful include a thick foam roller and one called The Stick (figure 3.16). Both of these tools have multiple uses but are especially good on the legs. There are other variations of the stick-type tool, including the padded and unbendable Tiger Tail, sold by Pressure Positive. A simple dowel rod or old broom stick will do as well. Even a rolling pin can feel good as a massage tool. You don’t have to spend a lot of money to get out of pain. A hook-type tool, a few rubber balls, and a smoothed-out wooden stick may be all you’ll need.

Treating a Strain, or Spot-Specific Pain

Sometimes there is spot-specific pain—pain you can put one finger on—at the muscles’ attachment. Remember that tendons attach muscle to bone. Ligaments attach bone to bone. It is possible to get a strain in a tendon or a sprain in a ligament. In this section, you will learn how to treat a tendon or muscle-tendon junction strain. A strain is the same thing as a first or second degree tear. You’ll need to pay close attention to the actions that contract and stretch specific muscles. If this book does not offer enough information, a good functional anatomy text will help. See the Resources section at the back of the book for suggestions.

Often pain gets diagnosed as inflammation or some big word that ends in “itis,” like tendonitis or lateral epicondylitis, for example. When inflammation is really present, there will be symptoms such as localized heat, redness, swelling, pain, and sometimes loss of function. A diagnosis of tendinitis is very common, but the concept may be all wrong. The studies on tendinitis show that often there is no inflammation present (Khan et al. 2000).

Recently, there has been a move to rename this condition tendinosis. This new term basically means there is pain at either the tendon attachment on the bone or at the junction where muscle becomes tendon.

Spot-specific pain with active or resisted motion generally means that there is too much tension pulling on the tendon. Remember that muscle is the contractile tissue of the unit, not the tendon, yet much of the treatment is focused at the site of the symptom (the attachment). In the case of *tendinosis*, it is better therapy to unload the short, tight muscles that are creating strain at the attachment site. This includes massaging the whole muscle and the belly of the muscle fiber where the trigger points occur. After thoroughly massaging the muscle, massage the spot-specific site of pain with multidirectional friction for twenty to thirty seconds. Basically, that means that you press into the spot, go left and right, then up and down, and then diagonal for a short while. Little by little, work successively deeper. This should feel only *slightly* uncomfortable. The next step is to move the muscle actively through its full range of motion. Does it still hurt? If not, try adding a little resistance to the movement with a few pounds of pressure from your hand. If it feels fine, add more resistance. If it hurts, repeat the multidirectional friction for twenty to thirty seconds more. Repeat the frictioning up to three times in one session. If the site of pain changes slightly, massage the new site. Retest for pain (Waslaski 2012).

Once you have achieved pain-free range of motion, it is time to very gently lengthen and contract the muscle at the same time. This is called *eccentric contraction*. The muscle-tendon unit that is being massaged contracts a little while it is being actively stretched. So, let's use the example of tennis elbow where one of the forearm extensor muscles (on the hairy side of the arm) can cause a strain at the lateral epicondyle (part of the elbow). To treat a spot-specific pain on the outer elbow, you would hold the wrist straight, palm down, and then press the back of the hand gently with your opposite hand into bending the wrist down toward the bald, or flexor, side of the arm. Do this slowly with just a little resistance. While the opposite hand is gently lengthening the forearm extensors (hairy side), resist the movement just a little. It is kind of a battle: contract and stretch at the same time while letting the stretch slowly win. Repeat the eccentric contraction several times, slightly increasing the resistance each time. This should be pain free. If you feel spot-specific pain again with active motion or bearing weight (resisted movement), re-treat with multidirectional friction until pain-free range of motion is restored. Repeat the sequence of frictioning, active or resisted movement, and eccentric contraction until the area is pain free. Remember, before treating the site of the strain, the muscle or muscle group must be massaged, including the trigger points. A protocol of stretching the shortened muscles and strengthening the opposing long and weak muscles may further the therapy and prevent a recurrence (Waslaski 2012). This protocol can be adapted to any muscle or tendon strain. Simply study the actions of the muscle to understand how to do eccentric contraction or lengthening contraction.

Stretching

Stretching is one of the most common approaches to treating myofascial pain. However, therapeutic stretching can have a negative outcome, especially in chronic pain conditions. If physical therapy has failed you or increased your pain, it may be because the physical therapist did not treat trigger points. Many clinics employ the use of heat, then stretch the tight, short muscles and strengthen the weak, overstretched muscles. This is the right idea, but if a short, tight muscle is harboring trigger points, it won't effectively stretch. Specific massage to the trigger points before stretching greatly improves the outcome. If you already stretch frequently from a regular yoga practice, athletic activity, or exercise you may be more likely to react favorably to stretch therapy.

The original hands-on approach to trigger points, ischemic compression, also uses a gentle lengthening of the muscle after the trigger point softens or releases. In previous editions of this book, a more conservative approach was advocated using a moving massage stroke and no stretch afterward. As mentioned earlier, this method works very well for people working independently without the benefit of professional treatment or oversight. Many folks have gotten the impression that all stretching is counterproductive. This is not true. Stretching is important but not the whole story. This book was created to put focus on the missing piece in the treatment of pain: trigger points. When the trigger point is adequately treated,

Specific massage to the trigger points before stretching greatly improves the outcome.

then it is appropriate to begin lengthening. The following is a brief description of three types of stretching that you may find useful.

General Guidelines for Stretching

There are many different methods of stretching. It is hard to know whom to follow or what dogma to believe, but here are some general guidelines to follow:

- Stretching should feel good, not painful.
- It is important to keep the stretch pain free, slow, and fluid.
- The results should be increased range of motion and a greater sense of ease.

Stretching should feel good, not painful.

If pain results, the stretching may be either too intense, too soon, or held too long. Joints that are restricted by the fascia inside the joint capsule may have a bone-on-bone-like quality, which means there is an abrupt end to the range of motion during a stretch. It just won't go any more and may produce pain in the joint itself. Most joints should feel "leathery" at the end of their range of motion, meaning they give a little. It is not wise to push past this abrupt bone-on-bone end feel of a stretch. It won't get you anywhere over time and may even create more restrictions on the joint. A straight elbow is a good place to feel a normal bone-on-bone end feel. A professional therapist may need to release the deep investing fascia inside the joint before the joint can gain more range of motion (Waslaski 2011).

Some orthopedic massage therapists and physical therapists do this technique.

Static Stretching

Static stretching (also known as "passive stretching") simply uses the gravity of the weight of another body part to create a sustained lengthening of the soft tissue. There is much debate about how long to hold a static stretch—with the range being anywhere from a few seconds to several minutes, in the example of Hatha yoga. The ideal length of a stretch may have to do with the type of muscle being treated. *Postural muscles*, which are the ones used to keep the body upright during walking, may be able to tolerate a longer stretch, while the *phasic muscles*, those associated with power movements, may require less time to lengthen their connective tissue. Holding a stretch for fifteen to twenty seconds is commonly thought to bring about the best results (Lowe 2009).

Ballistic Stretching

Ballistic stretching is the use of bouncing to enhance a stretch. Many believe that this is a dangerous way to stretch and advocate against it, while others make the case that for athletic activity it may offer unique benefits. Practicing sudden lengthening movements, such as those that occur in many sports, may benefit muscle tissue. Ballistic stretching may accomplish this goal by increasing muscle, tendon, and fascial elasticity. Even better than ballistic stretching alone may be using it in combination with static stretching or one of several active-assisted methods of stretching (Lowe 2009).

Active Assisted Stretching

The category of *active assisted stretching* is an umbrella term used to describe the methods of stretching based on the neurological principles of post-isometric relaxation (PIR) and reciprocal inhibition. *Post-isometric relaxation* requires a muscle to contract for three to ten seconds before lengthening into a stretch. *Isometric* means that the muscle does not shorten in length but simply tightens or increases in tension. This contraction can be done against resistance, as when you tighten your calf muscles by pushing your toes into the floor while seated. Methods using

this principle are called proprioceptive neuromuscular facilitation (PNF), muscle energy technique (MET), contract-relax, and facilitated stretching (Lowe 2009).

Active isolated stretching (AIS) contracts the opposing muscles to activate the body's own relaxation mechanism, which is called *reciprocal inhibition*. This is the mechanism that allows one group of muscles to relax fully to allow the opposite (or antagonist) muscles to contract. This type of stretching holds the contraction and stretch for just two seconds before relaxing and repeating several times. For example, to stretch the chest, you would contract the rhomboids and middle trapezius muscles in the upper back to pull the shoulder blades together. Then you would add a little more stretch by leaning into a doorway to push the arm even farther back.

Stretching after Trigger Point Massage

As discussed above, there are many differing ideas about how to stretch. There is also debate about when to stretch. The most important aspect of stretching is that it should be pain free. If a muscle is not ready to let go, it will send a pain response. If you have had a painful experience with stretching therapy, you may find it helpful to think of stretching as simply lengthening rather than forced stretching. The approach to stretching discussed in this book is a conservative one. No matter how you stretch, it is important to treat the trigger points first. Stretching can be done right after treating a specific muscle and its trigger points or systematically at the end of a self-treatment or therapy session.

The following protocol uses a combination of post-isometric relaxation and active isolated stretching as described in the section “General Guidelines for Stretching” above. It works very well for most people. The example will be stretching the pectoralis major muscle of the chest.

Begin by exploring and treating all of the trigger points in a muscle to the point where it is no longer referring pain and the trigger point is significantly less painful locally. See the section “Massage Technique” above if you skipped it.

1. Actively move the muscle and corresponding joint through its full range of motion three times. For the pectoralis major, a full range of motion would be moving the arm across front of the body, then out to the side, and up over the head and down.
2. When this can be done pain free, you are ready to try lengthening. If it is not pain free, continue to explore for other trigger points in the same muscle or in other muscles. In some cases, it may take multiple treatments over the course of days (maybe even weeks) before pain-free range of motion is achieved. Listen to your body. If there is spot-specific pain, see the section “Treating a Strain, or Spot-Specific Pain” above. Isometrically contract the muscle for seven to ten seconds with about 20 percent of your muscle capacity—that is, tighten the muscle without shortening it. This often is done against the resistance of a wall, the floor, or another body part. If you are unsure of the muscle's action, look up the muscle again and read the first section of text under the muscle's name. A doorway stretch is a good way to stretch our sample muscle, the pectoralis major. Start by standing in the middle of an open doorway. Bend one arm at the elbow (like you are raising your hand in class), and place the palm of this hand and its whole forearm on the outer frame of the doorway. To isometrically contract the pectoralis major muscle, press your whole forearm into the doorframe as if to knock it down in front of you (but with only 20 percent of your muscle ability). Hold this contraction for seven to ten seconds.
3. Without changing position, relax the contraction and take a deep breath.
4. While exhaling, lengthen the muscle by fully contracting its opposing muscle. This simply means to do the opposite motion. So, if doing a doorway stretch, now pull your whole arm and shoulder back as if preparing to throw a ball. While continuing this contraction of the opposite muscles (rhomboids and middle and lower trapezius, in this case), add a little more length to the stretch by pushing the stretch further against an object (in this case, a doorway). Hold this stretch for just two seconds—discomfort free! To understand

the contraction of other opposite (or antagonist) muscles, it might help to think of the body as a system of levers and pulleys. If the muscle you are wanting to stretch bends a joint, straighten the joint to stretch the muscle, or if the muscle turns the joint inward toward the front of the body, then to stretch it, go the other way, toward the outside of the body.

5. Repeat the sequence three or four times until the full range of motion is achieved.

This protocol can be used with any muscle. Our book will not attempt to duplicate the excellent work of other resources completely dedicated to stretching. When you are ready for stretching, it would be wise to consult a physical therapist, personal trainer, advanced massage therapist, or one of the many books or websites on stretching.

Making the Method Work

Even though trigger point massage works extremely well for getting rid of trigger points and referred pain, don't be surprised if you encounter some snags. The current health of your muscles, and body as a whole, is an accumulation of years of living. Everything plays a role in who you are physically today: your accidents, injuries, pregnancies, surgeries, habits, level of physical fitness, the food you eat, the vitamins you take, the way you cope with stress. The list goes on and on, right? We know these things. We know this, and yet when we begin a new treatment regime or a new diet, we expect instant results. Sometimes, though, it takes a little while to figure things out—what works for your body, how to do the treatment, how many times a day, how to stretch, and finally how to change the habits that are getting you into trouble. Cut yourself some slack. Rome wasn't built in a day, and neither was your current state of health. Give the therapy a chance to work, but keep your eyes open to learning some lessons along the way.

Worrisome Results: Bruising and New or Worsening Pain

Deep massage may occasionally cause bruising in tender areas. This is usually nothing to worry about, but you might want to let up a little on the pressure you're using. Bruising is a sign that you're trying too hard. It may also be a sign you're working the wrong place, particularly if you're working a lot and getting little improvement. Certain medications, such as blood thinners (including aspirin, ibuprofen, Plavix, and Coumadin) and corticosteroids (including cortisone, hydrocortisone, and prednisone) can increase risk of bruising with deep massage. Dietary supplements of fish oil, ginkgo, ginger, dong quai, and garlic may also contribute to bruising. Analgesics and anti-inflammatory drugs can reduce your awareness of sensation, making it easier to overtreat sore muscles (Smith and Lal 2009).

If you have new or worsening pain after trigger point massage, ice the affected area for ten to fifteen minutes several times throughout the day. If ice is unavailable, simply give the offended trigger point very gentle massage, almost as if you were massaging a baby. Icing and gentle massage should calm down the pain fairly quickly. Without intervention, the worst that will happen is that the activated trigger points will stay irritated for up to two to three days. Then ask yourself these questions: What went wrong? Was the massage done too long, too intensely, or too often? Was the massage done in the wrong place? Was it a satellite area where other trigger points commonly refer the pain? (See the Other Symptoms Guide, Pain Guide, and Pain Illustrations Guide for the area you are treating.) Was the massage done to an overstretched antagonist, or opposite, muscle? Sometimes overstretched muscles become weak and develop trigger points in defense. A good example of this is the relationship between short, tight pectoralis major and pectoralis minor muscles of the chest versus the often overstretched, weak rhomboids and trapezius of the upper back. The overstretched upper back muscles will have trigger

Use the Pain Guide and Other Symptoms Guide at the beginning of each muscle chapter to help you find the trigger points you need to treat. Remember that in some areas, such as the hands, shoulders, and low back, pain can be a composite of referral from several muscles.

points and local pain, while the chest muscles will have no pain symptoms. In this case, the short, tight pectoralis muscles are the problem and the overstretched back muscles are the symptom. You would massage and stretch the pectoralis muscles to relieve the pain in the back. For more information on overstretched antagonist muscles, read the sections “Primary and Satellite Trigger Points” and “The Victims Cry, the Perpetrators Don’t—Antagonist Trigger Points” in chapter 2.

No Results: Why?

Half-hearted efforts at self-treatment won’t get you very far. Once or twice a week simply won’t do it. If you’re not getting the results you think you should be getting, consider whether you’re doing enough massage. Your really bad trigger points should have at least three treatments a day. Remember that treatment should be less than a minute long. Those are very tiny snippets of time out of your schedule, not enough to slow you down or interfere with your day. You will be disappointed in the outcome if you do less. You need to only do ten to twelve strokes per session on any given trigger point to have a beneficial effect. In addition to multiple treatments during the day, be sure to massage your really difficult trigger points just before going to bed and again when you get up in the morning. If pain wakes you up in the night, get up and have a session. As a general rule, massaging often is much better than massaging too hard or too long. You may benefit from a few sessions with a professional massage therapist who knows trigger points well. You may be missing a postural dysfunction pattern where muscle imbalances or structural inequalities are ultimately responsible for your pain. See the section “Trigger Point Perpetuators” in chapter 2.

Trigger point massage works extremely well for muscle pain. Done correctly, it often shows clear results well within a week, sometimes in just a day or two. Chronic pain will take longer to resolve, but you should see a relationship between doing a treatment and a reduction of symptoms. Give it a two-week trial, then re-evaluate. Keep in mind that pain that persists could have an organic or systemic cause. If your pain began with an accident or a fall, you may have bone or tissue injuries that need medical attention. If you hurt all over or if massage is doing no good at all or seems to make the pain worse (even when done with feather-light touch), you may be dealing with some other systemic problem and you will have to seek other remedies.

The Effect of Other Health Factors

If you’re successful in deactivating your trigger points, but your pain seems to come back after a short time, you may have health factors that predispose your muscles to the development and perpetuation of trigger points. These things are discussed in more detail in chapter 2. For an extensive discussion of perpetuating factors, chapter 4 in volume 1 of *Myofascial Pain and Dysfunction: The Trigger Point Manual* (Simons, Travell and Simons 1999) is the ultimate resource.

Consider whether you may be lacking B, C, or D vitamins or calcium, magnesium, folate, iron, or potassium. Smoking, excess alcohol, birth control pills, and certain other drugs deplete these nutrients. You may have a thyroid inadequacy. Hypoglycemia can aggravate trigger points. Question whether you’re drinking enough water. *Hyperuricemia*, a condition where you’re not getting enough water or your kidneys aren’t doing their job, can keep your trigger points going. Diseased or dysfunctional internal organs can make it difficult to get rid of trigger points in external muscles. Chronic infections, cancer, or allergies may perpetuate trigger points. Be aware that food allergies can play a role in both myofascial pain syndrome and fibromyalgia.

Postural distortions including scoliosis, leg-length inequality, short upper arms, a small hemipelvis, or Morton’s foot can cause dysfunction and myofascial pain. Sometimes these dysfunctions are mechanical and not permanently structural. One leg can appear long when one side of the pelvis is being pulled forward by the iliopsoas, rectus femoris, and tensor fasciae latae muscles. The resulting scoliosis may be treatable with massage therapy

techniques. Much of this therapy you can do yourself as a collaborating participant in your own care. Finding a competent therapist in your area who can help you help yourself may be essential.

Expectations: What's Realistic?

You may wonder what you should expect of trigger point massage. You may want to know how many massage sessions will be needed to make your pain go away. Will your trigger points come back? Can you expect to be truly pain free? All of these things depend to a great degree on how much intelligence and commitment go into your efforts.

Be realistic regarding expectations of success with trigger point therapy. Although you may occasionally experience the much-desired one-shot fix with trigger point massage, it's wise not to plan on it. The body can be very good about healing itself with the right stimulus. This happens most often with new pain. Long-standing trigger points require considerable attention; this will be true whether you do the massage yourself or seek help from a professional.

People tend to quit too soon. You will be tempted to stop doing your massage the minute the trigger point stops actively referring pain. Remember that if the trigger point still hurts when you press on it, you've only soothed it into a latent state. Leaving a trigger point in the latent state allows it to be quickly reactivated by overuse, injury, or stress. Massage must continue until the trigger point no longer hurts when you press on it. Massage works miracles with trigger points but only when done correctly and completely.

The Learning Curve

You'll be surprised at how quickly you can forget even your most useful discoveries about myofascial pain. It's helpful to keep a pain diary about what you learn from day to day, making notes about the tricks and tools that work best. Then, when a problem comes up again, you'll find the solution all worked out in your diary and you won't have to reinvent the wheel.

To succeed in making this method work for you, the old rule applies: just keep trying. For difficult problems, read and reread and then read again any passage in this book that may apply. Underline and make notes in the margins. All the anatomical detail and all the ramifications regarding myofascial pain are so new that you're bound to feel mystified and overwhelmed sometimes. However, self-treatment of pain is much simpler than it seems at first, and it will eventually all come together. Don't give up! Keep trying!

You'll experience a long learning curve to master everything in this book, but you can expect to see positive

Trigger point
massage is
truly a life skill.

results from the very beginning. Trigger point massage is truly a life skill. Work on knowing the muscles and bones. It's important that you understand what's beneath the surface of your skin. To augment what you see in this book, you may want to get Frank Netter's *Atlas of Human Anatomy* and study his magnificent illustrations. If you've got the stomach to learn from dissected bodies, the six-part video *Atlas of Human Anatomy*, by Robert Acland, will give you some unique insights.

Dr. Acland uses a moving camera technique to create a three-dimensional view, which reveals the structure of human anatomy. There are many good, inexpensive anatomy apps for smartphones and other mobile devices. There are many other resources on trigger points. Consult other books that explain things in a different way. (See Resources at the back of this book.) In whatever way you can, keep exploring and keep learning. You deserve to be pain free.

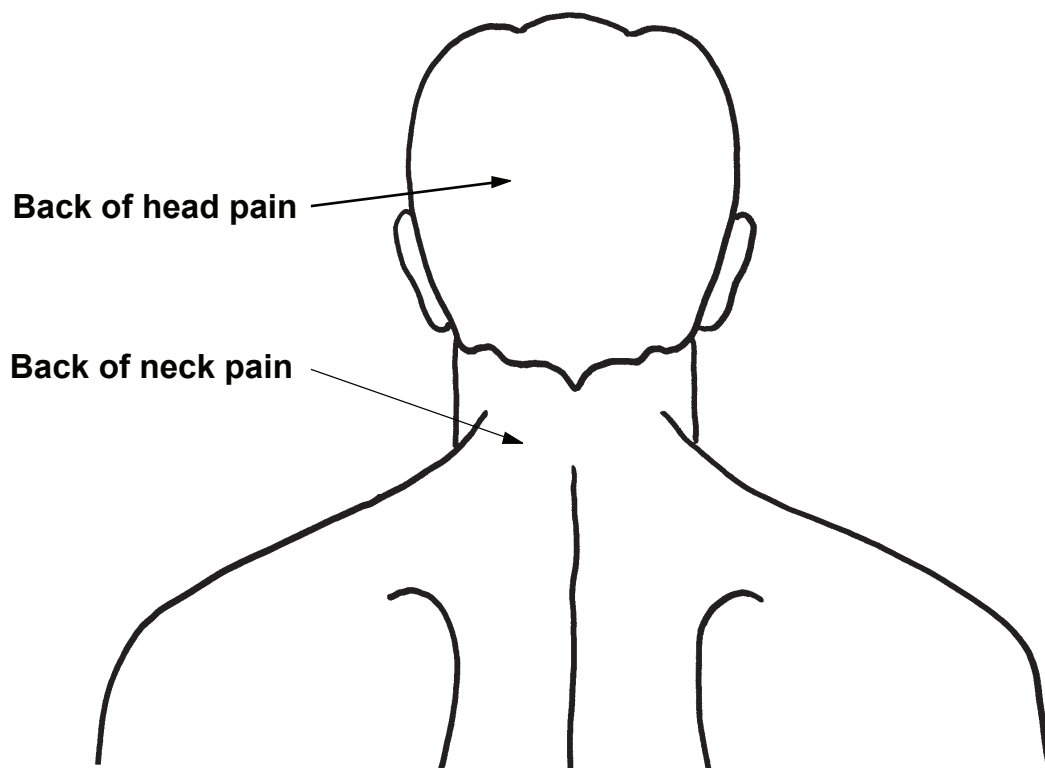
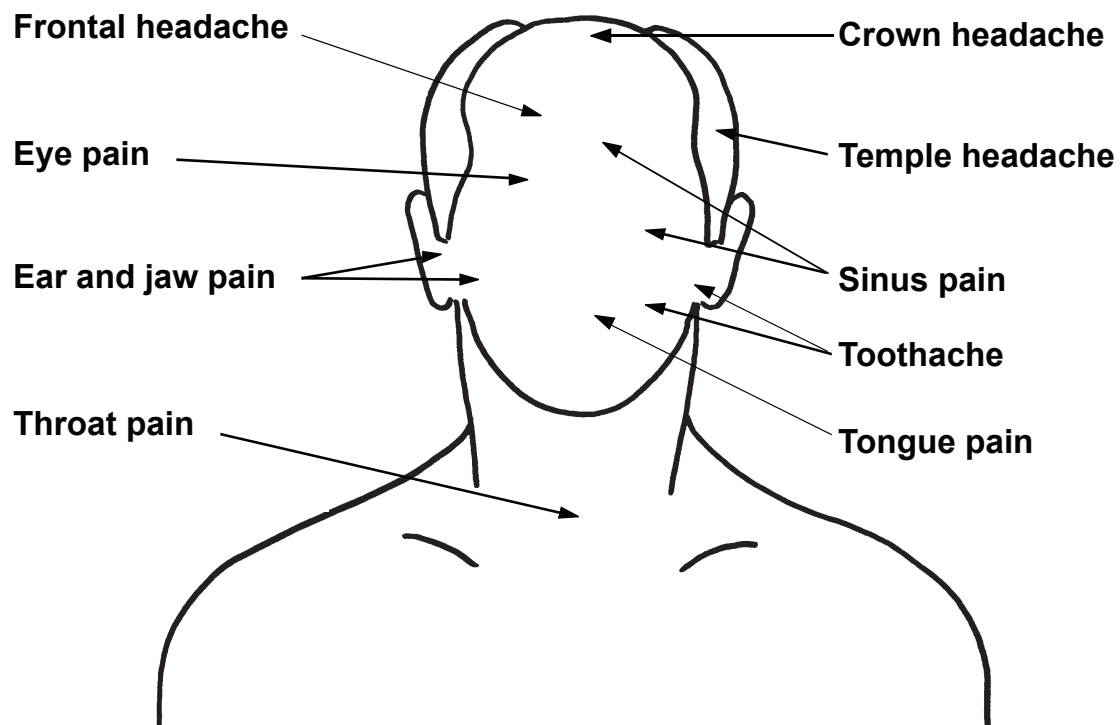
Reducing Tension: Other Benefits of Massage

When done by a professional, massage can be profoundly relaxing, reducing heart rate, blood pressure, and respiration along with reducing muscle tension. It may not be reasonable to hope for quite as much benefit as when you do your own massage, but the relaxing effect can still be considerable. You can also use your own self-treatment sessions to slow down and calm down. Try consciously relaxing whatever muscle you're working on. When you are able to relax one muscle, your entire body tends to relax, too.

When you intentionally reduce tension in your muscles, you can also reduce the pain produced by trigger points. If you're good enough at it, the pain reduction can nearly equal that of a prescribed painkiller. Read chapter 12, *Muscle Tension and Chronic Pain*, for more information on relaxation. Muscle relaxation won't get rid of trigger points, but it can make the pain more bearable until your self-applied trigger point massage begins to have big results.

Chapter 4

Head, Face, and Neck Pain



Pain Guide

Head, Face, and Neck

Boldface type indicates a primary pain pattern. Regular type refers to a less common or satellite trigger point pattern. Muscles are listed in the order of how likely they are to be the problem. *Also see Other Symptoms Guide.* We've made these guides available for download at www.newharbinger.com/24946. See the back of the book for more information.

Back of Head

trapezius (66)
 sternocleidomastoid (62)
 semispinalis (74)
 splenius cervicis (75)
 suboccipitals (78)
 occipitalis (88)
 digastric (85)
 temporalis (81)

Back of Neck

trapezius (66)
 multifidi (78)
 levator scapulae (59)
 splenius cervicis (75)
 infraspinatus (94)
 digastric (85)

Crown Headache

sternocleidomastoid (62)
 splenius capitis (74)

Ear and Jaw

lateral pterygoid (83)
 masseter (82)
 medial pterygoid (83)
 sternocleidomastoid (62)
 trapezius (66)
 soleus (270)

Eye and Eyebrow

sternocleidomastoid (62)
 temporalis (81)
 splenius cervicis (75)
 masseter (82)
 suboccipitals (78)
 occipitalis (88)
 orbicularis oculi (87)
 trapezius (66)

Frontal Headache

sternocleidomastoid (62)
 semispinalis capitis (74)
 frontalis (88)
 zygomaticus major (87)

Sinus

sternocleidomastoid (62)
 masseter (82)
 lateral pterygoid (83)
 orbicularis oculi (87)
 zygomaticus major (87)

Temple Headache

trapezius (66)
 sternocleidomastoid (62)
 temporalis (81)
 splenius cervicis (75)
 suboccipitals (78)
 semispinalis capitis (74)

Throat

sternocleidomastoid (62)
 digastric (85)
 medial pterygoid (83)
 longus colli (88)
 platysma (88)

Tongue

sternocleidomastoid (62)
 medial pterygoid (83)
 mylohyoid (86)

Toothache

temporalis (81)
 masseter (82)
 digastric (85)

Other Symptoms Guide

Head, Face, and Neck

Blurred Vision

splenius cervicis (75)
suboccipitals (78)
sternocleidomastoid (62)

Cough

sternocleidomastoid (62)

Dizziness

sternocleidomastoid (62)

Ear Itch

masseter (82)

Ear Stuffiness

masseter (82)
medial pterygoid (83)

Excess Mucus or Phlegm

sternocleidomastoid (62)
lateral pterygoid (83)
zygomaticus (87)
levator labii (87)

Eyelid Droop

sternocleidomastoid (62)
orbicularis oculi (87)

Eye Redness

sternocleidomastoid (62)

Eye Twitch

sternocleidomastoid (62)
orbicularis oculi (87)

Hearing Loss

sternocleidomastoid (62)

Imbalance

sternocleidomastoid (62)

Malocclusion of Teeth (teeth do not fit together)

temporalis (81)
lateral pterygoid (83)
digastric (85)

Migraine Headache

trapezius (66)
sternocleidomastoid (62)
splenius cervicis (75)
suboccipitals (78)
temporalis (81)

Nausea

sternocleidomastoid (62)

Numbness

Head

splenius cervicis (75)
semispinalis capitis (74)

Pain or Trouble with Motion

Head: Lying Down

semispinalis capitis (74)

Teeth: Biting Down

medial pterygoid (83)

Throat: Swallowing

medial pterygoid (83)
digastric (85)
mylohyoid (86)

Reduced Range of Motion

Jaw

masseter (82)
temporalis (81)
lateral pterygoid (83)
medial pterygoid (83)
digastric (85)

Neck: Flexion/Extension

semispinalis (74)
splenius cervicis (75)
suboccipitals (78)

Neck: Rotation

levator scapulae (59)
splenius cervicis (75)
suboccipitals (78)
sternocleidomastoid (62)
trapezius (66)

Neck: Sideways Flexion

trapezius (66)
sternocleidomastoid (62)
splenius cervicis (75)
scalenes (96)
suboccipitals (78)

Sinus Drainage

masseter (82)

Sore Throat

sternocleidomastoid (62)
longus colli (88)

Stiffness, Neck

trapezius (66)
levator scapulae (59)
semispinalis (74)
splenius cervicis (75)
sternocleidomastoid (62)
suboccipitals (78)

Swallowing Difficulty

lateral pterygoid (83)
medial pterygoid (83)
longus colli (88)

Tearing

sternocleidomastoid (62)

Temporomandibular Joint (TMJ) Dysfunction

- masseter (82)
- lateral pterygoid (83)
- medial pterygoid (83)
- temporalis (81)
- sternocleidomastoid (62)

Tenderness

Back of the Head

- semispinalis capitis (74)

Scalp

- sternocleidomastoid (62)

Tinnitus (ringing in the ears)

- masseter (82)
- sternocleidomastoid (62)
- lateral pterygoid (83)

Tooth Sensitivity

- masseter (82)
- temporalis (81)
- digastric (85)

Trigeminal Neuralgia

- sternocleidomastoid (62)

Vertigo

- sternocleidomastoid (62)

Visual Disturbances

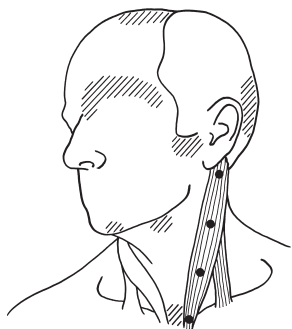
- sternocleidomastoid (62)
- splenius cervicis (75)
- suboccipitals (78)

Vocal Tension

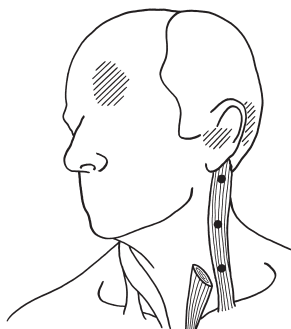
- masseter (82)
- mylohyoid (86)
- longus colli (88)

Pain Illustrations Guide

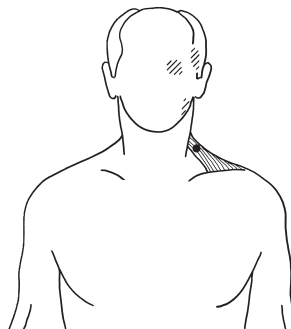
Head, Face, and Neck



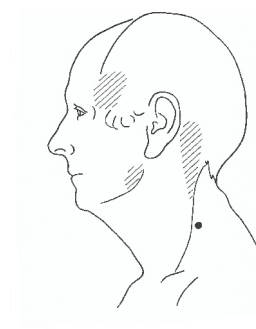
Sternocleidomastoid, sternal branch: trigger points and referred pain pattern (p. 63)



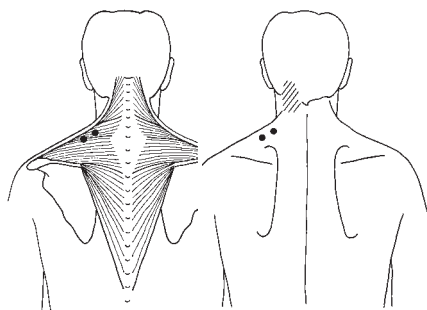
Sternocleidomastoid, clavicular branch: trigger points and referred pain pattern (p. 63)



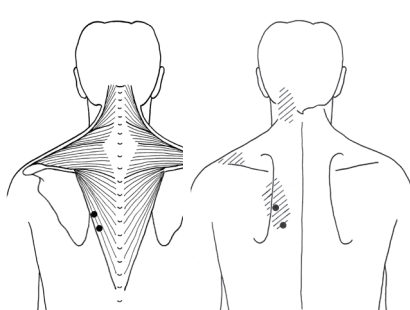
Trapezius number 1 trigger point and referred pain pattern: front view (p. 67)



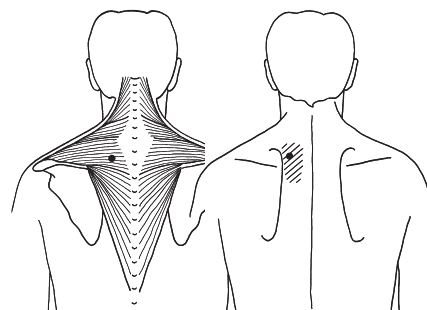
Upper trapezius number 1 trigger point and referred pain pattern: side view (p. 73)



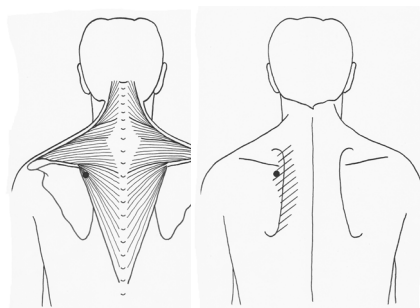
Upper trapezius number 2 trigger points and referred pain pattern (p. 67)



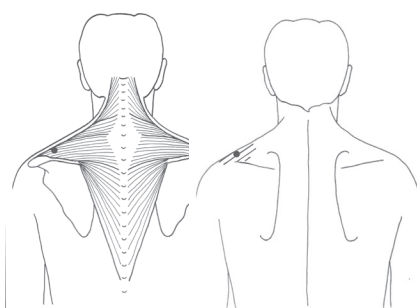
Lower trapezius number 3 trigger points and referred pain pattern (p. 68)



Trapezius number 4 trigger point and referred pain pattern (p. 68)

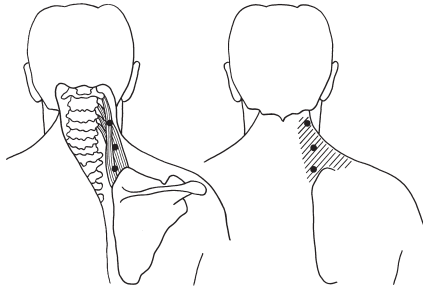


Middle trapezius number 5 trigger point and referred pain pattern (p. 68)

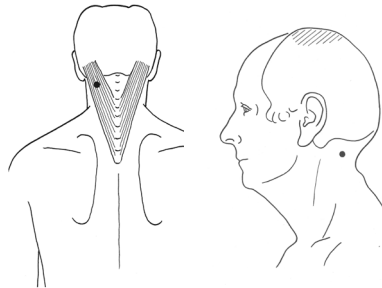


Upper trapezius number 6 trigger point and referred pain pattern (p. 69)

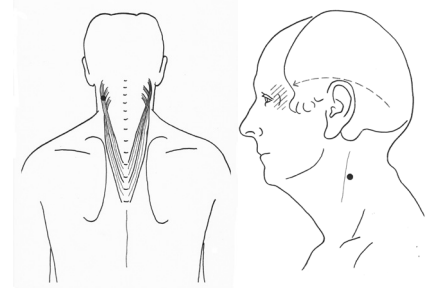
We've made this guide available for download at www.newharbinger.com/24946. See back of book for more details.
Caution: Please read the full treatment instructions for each muscle before beginning.



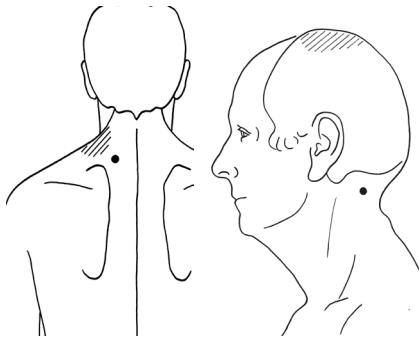
Levator scapulae trigger points and referred pain pattern (p. 72)



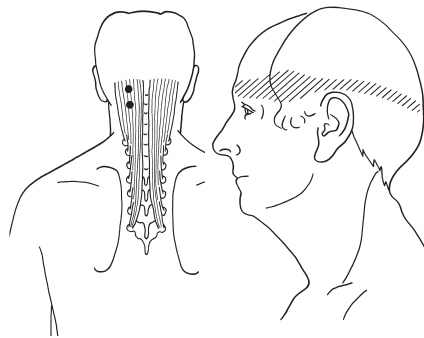
Splenius capitis trigger point and referred pain pattern (p. 75)



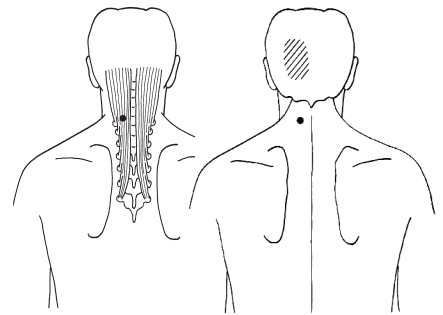
Splenius cervicis number 1 trigger point and referred pain pattern: through the head like a spear to the back of the eye (p. 75)



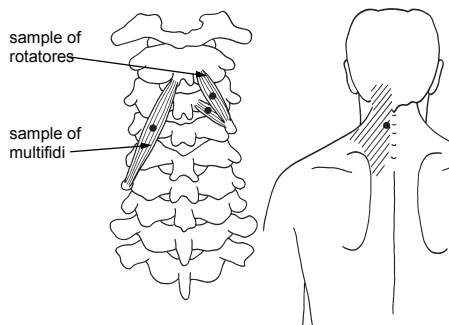
Splenius cervicis number 2 trigger point and referred pain pattern (p. 76)



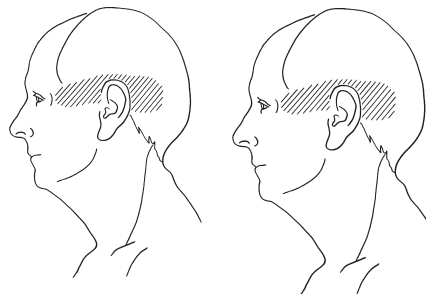
Sample semispinalis capitis number 1 trigger points and referred pain pattern (p. 77)



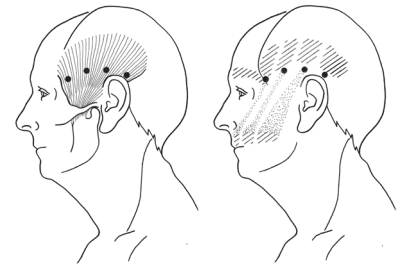
Sample semispinalis capitis number 2 trigger point and referred pain pattern (p. 77)



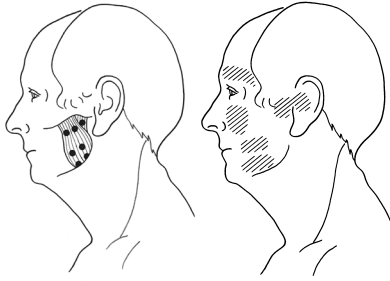
Multifidi and rotatores trigger points and referred pain pattern (p. 78)



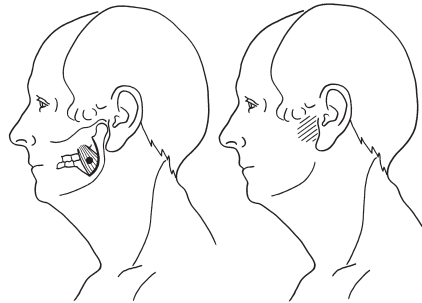
Suboccipitals referred pain pattern (p. 79)



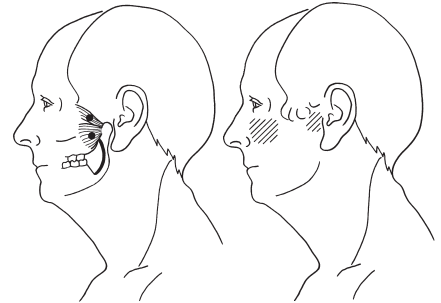
Temporalis trigger points and referred pain patterns (p. 81)



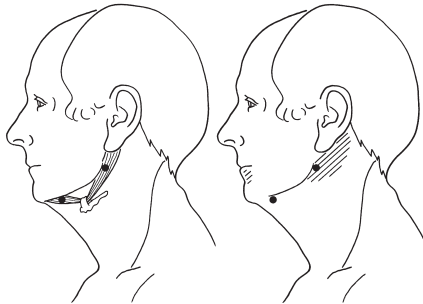
Masseter trigger points and referred pain pattern (p. 82)



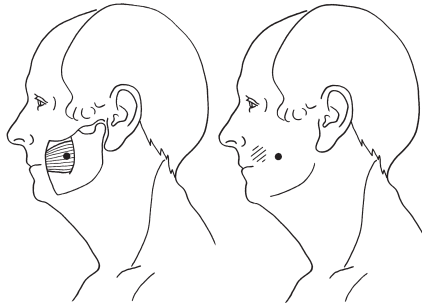
Medial pterygoid trigger point and referred pain pattern. (Note that the jawbone is cut away to reveal this muscle deep to the bone.) (p. 83)



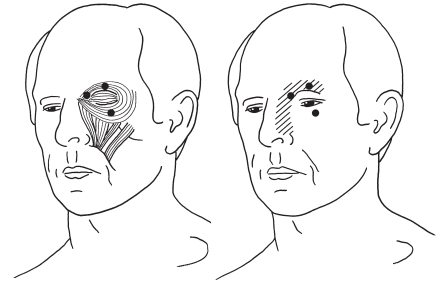
Lateral pterygoid trigger points and referred pain pattern (p. 84)



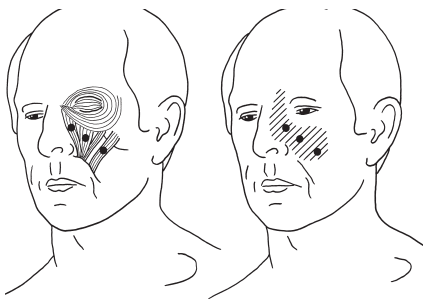
Digastric trigger points and referred pain pattern. Pain shown below the lower lip is actually felt in the lower teeth. (p. 85)



Buccinator trigger point and referred pain pattern (p. 86)



Obicularis oculi trigger points and referred pain pattern (p. 87)



Zygomaticus and levator labii trigger points and referred pain pattern (p. 87)

Head and Neck Pain

Trigger points cause an astonishing variety of symptoms in the head and neck region. Some of their effects may contradict a lot of what you've always believed. Trigger points are known to cause pain and hypersensitivity in your teeth, pain and stuffiness in your ears, pain and redness in your eyes, sinus pain and drainage, stiff neck, chronic cough, and sore throat. Trigger points can cause dizziness and balance problems. They can blur your vision and make the words dance around on the page when you're trying to read. They can make your lips numb, your tongue hurt, or an eyelid droop (Simons, Travell, and Simons 1999).

Furthermore, trigger points are responsible for much of the pain associated with temporomandibular joint (TMJ) syndrome and are involved in important ways with the other symptoms of this disturbing condition, including popping and clicking in the jaw, dislocation of the jaw, restriction of jaw opening, and malocclusion of the teeth (Simons, Travell, and Simons 1999).

If this isn't enough, the work of Travell and Simons has shown that trigger points are often the hidden and unsuspected cause of many headaches, no matter what name they're given: tension headaches, cervicogenic headaches, cluster headaches, vascular headaches, or migraines (Simons, Travell, and Simons 1999). Many recognized "headache triggers" actually have their effect by cranking up your latent trigger points. A bad cough can do it; so can a viral infection, a hangover, overexertion, analgesic rebound, and consumption of too much sugar. Trigger points are one of the operational elements in headaches set off by allergic reactions, chemical withdrawal, physical trauma, and emotional tension. Even the frustrating, unexplainable headaches that come with fibromyalgia can be shown to be due to the presence of trigger points (Simons, Travell, and Simons 1999).

The paradox about headaches is that the cause is rarely in the parts of the head that hurt. Most headaches come from trigger points in jaw, neck, and upper back muscles. Upper back muscles cause neck pain, and then neck muscles cause headaches. This physical distance between cause and effect is why headaches can be so mysterious and hard to deal with.

Upper back muscles cause neck pain, and then neck muscles cause headaches.

The confusing thing about neck pain is that it is referred most of the time from trigger points in the upper back and shoulders. Few things feel better than a good neck massage, but it's massage of the upper shoulders and upper back that fixes neck pain. Neck massage fixes headaches. Trigger points in the back of the neck muscles can participate in producing neck pain, but they are usually only satellites of central trigger points in the trapezius. Because of this satellite phenomenon, the search for the ultimate cause of chronic headaches can lead you down to this very muscle, the trapezius.

Obviously, pain and other symptoms in the head and neck area can have causes other than myofascial trigger points, but trigger points should always be one of the first things to be considered, because they can be so quickly checked out. You only need to know where to look. The Pain Guide, Other Symptoms Guide, and Pain Illustrations Guide at the beginning of this chapter will provide the guidance you need in that regard.

Whiplash

Nicole, a registered nurse, age forty-six, was rear-ended by a semi on the interstate. She wasn't seriously hurt, other than suffering whiplash. But the whiplash left her with pain behind one eye and a constant headache that centered in two places, over her eyebrows and at the base of her skull. A doctor prescribed hydrocodone, which stopped the pain quite well. But as a nurse, Nicole knew the drug was addictive, so she limited herself to using it only when pain kept her from sleeping. Pressure on certain spots in her neck and upper back reproduced her various symptoms exactly. The therapist taught her how to massage several of the spots herself. This, along with weekly massage sessions, made her free of symptoms within six weeks.

Even a minor auto accident can cause whiplash, which typically results from sudden and extreme overstretching of muscles of the chest, upper back, and the front and back of the neck. Whiplash can produce not only

widespread pain in the head, neck, chest, and upper back, but also numbness, tingling, and swelling in the hands and fingers. Without appropriate treatment of myofascial trigger points in the injured muscles, the effects of whiplash frequently last for months and can persist for years.

Two sets of muscles of the front of the neck, the sternocleidomastoids and the scalenes, can be responsible for many of the symptoms of whiplash. Other muscles often involved are the trapezius, levator scapulae, pectoralis major and minor, sternalis, certain jaw muscles, deep cervical muscles of the anterior spine, and spinal muscles of the posterior neck and upper back.

Three Special Muscles of the Neck

The trapezius, levator scapulae, and sternocleidomastoid muscles are difficult to classify according to location. The trapezius is so large that it covers the upper back, the back of the neck, and part of both shoulders. The levator scapulae starts in the upper back but wraps around to become part of the side of the neck. The sternocleidomastoid also wraps around the neck and can be seen as part of either the side or the front of the neck. Further, the unique multiple functions of these three muscles puts each in a class by itself.

Sternocleidomastoid (SCM)

The name *sternocleidomastoid* (STUR-no-KLY-do-MAS-toid) is made up of the anatomical names for the

bones it attaches to (figure 4.1). *Sterno* refers to the sternum, or breastbone. *Cleido* refers to the clavicle, or collarbone. *Mastoid* is the mastoid process, the bony knob behind the ear. Don't be intimidated by this long, wonderful word. It has an infectious rhythm that you'll learn to love. You'd best make friends with your sternocleidomastoid muscles, because they make more trouble than you can imagine.

Since the sternocleidomastoids are on the front and side of your neck, you've probably never thought about them or even noticed them. You don't usually get pain in the front of your neck. You get it in the back of your neck. Trigger points in the sternocleidomastoid muscles actually cause an incredible amount of pain, but it's all sent elsewhere. The sternocleidomastoids themselves rarely hurt without touching them, no matter how much trouble they're in or how much trouble they're causing. Tightness or stiffness in these muscles, however, can indicate the presence of trigger points (Simons, Travell, and Simons 1999).

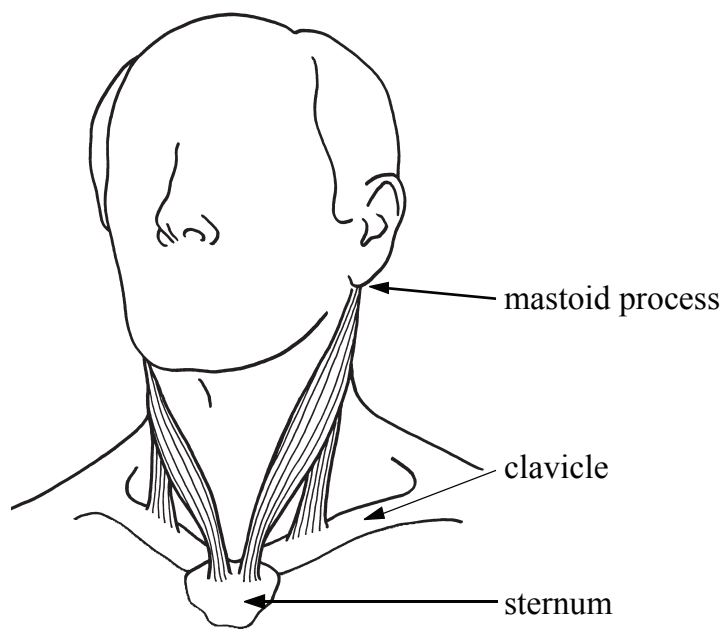


Figure 4.1 Sternocleidomastoid muscles and their attachments

Kate, age fifty-one, was a case that illustrates the unexpected effects that sternocleidomastoid trigger points can have and the dramatic and swift relief that can occur with appropriate treatment. She'd lived with TMJ pain in both jaws since the age of nine, when she'd had several teeth removed to compensate for a small jaw. She also had frequent headaches and pain deep in her left ear. One day, while reading an article about myofascial pain that

suggested neck muscles as the source of many mysterious symptoms, she began feeling her neck muscles with her hand. She was startled to find a big knot in the left side of her neck that she hadn't realized was there. While she was massaging the muscle, she experienced a release in her left jaw that was so sudden and intense that it frightened her. The side of her neck felt like it was expanding like a balloon. She ran to look at it in the bathroom mirror but could see no swelling or anything else wrong. Then she noticed the pain in her ear and jaws was gone and her bite felt different. Her jaw felt like it had shifted position. Her dentist, after inspecting the change, told Kate that her TMJ dysfunction had somehow resolved itself and she now had a proper bite.

From a myofascial viewpoint, massive chronic trigger points in Kate's sternocleidomastoids were directly to blame for her headaches and ear pain. They had also maintained secondary trigger points in the jaw muscles that were the cause of her jaw pain and the misalignment of her temporomandibular joints. She has learned that a few minutes of massage to her sternocleidomastoid muscles gets rid of her symptoms when she feels them coming back.

Symptoms

People are rarely aware of sternocleidomastoid trigger points, though their effects can be amazingly widespread. The trigger points can be so tender to pressure that they can be mistaken for swollen and sensitive lymph nodes. Swollen lymph nodes, however, feel like small unshelled peanuts floating just under the skin; they are so slippery that you won't be able to pinch them with two fingers. Symptoms created by sternocleidomastoid trigger points fall into six groups: referred pain—sternal branch, referred pain—clavicular branch, balance problems, auditory disturbances, visual disturbances, and systemic symptoms. There are important differences in the referred pain patterns for the two branches of the sternocleidomastoid muscle, although both generally send their symptoms upward to the cranium, face, and jaws (figures 4.2 and 4.3)

Referred pain—sternal branch (figure 4.2). Trigger points in the sternal branch can cause deep eye pain, tongue pain when swallowing, and headaches over the eye, behind the ear, and in the top of the head. They can contribute to temporomandibular joint pain and the creation of satellite trigger points in the jaw muscles. Pain is also sometimes sent to the back of the neck and to the top of the breastbone. Not shown in figure 4.2 is an occasional spillover of pain in the side of the face, which mimics trigeminal neuralgia, a disorder characterized by brief attacks of pain caused by irritation of the trigeminal nerve. This pain in the cheek can also be mistaken for sinusitis.

Referred pain—clavicular branch (figure 4.3). Pain from the deeper clavicular branch can make a frontal headache to the opposite side of the forehead, a deep earache, and a toothache in the back molars. A painless stiff neck that keeps your head tilted to one side is also possible (Simons, Travell, and Simons 1999).

Balance problems—clavicular branch (figure 4.3). Another unusual trait of trigger points in the clavicular branch is that they are apt to make you dizzy, nauseated, and prone to lurching or falling. Fainting

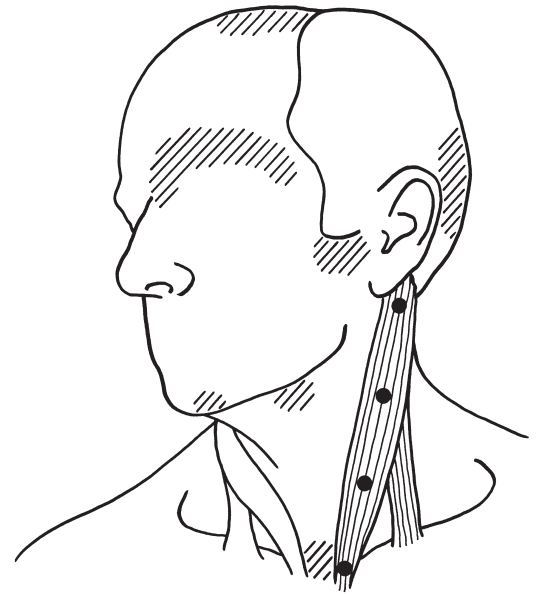


Figure 4.2 Sternocleidomastoid, sternal branch: trigger points and referred pain pattern

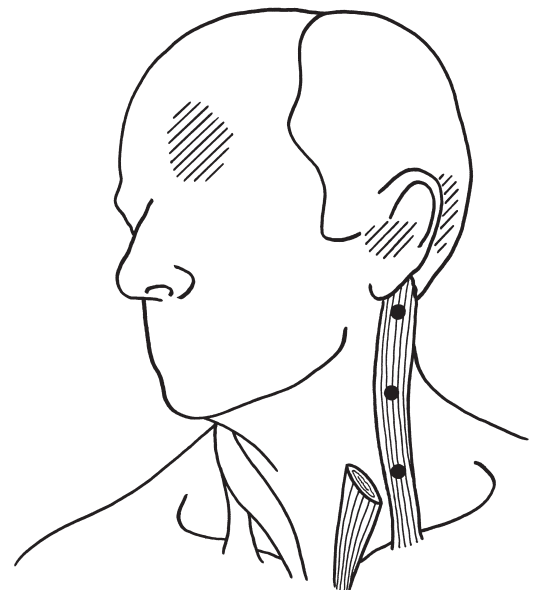


Figure 4.3 Sternocleidomastoid, clavicular branch: trigger points and referred pain pattern

may occur unexpectedly. This dizziness can occur suddenly or last for minutes, hours, or days. Often given a diagnosis of vertigo, or Ménière's disease, it can become a lifelong recurrent condition, defying all treatments and medical explanations.

The myofascial explanation is that differences in tension in the clavicular branch of the sternocleidomastoid muscles help with your spatial orientation, keeping track of the position of your head. When aberrant tensions in the muscles are caused by trigger points, confusing signals are sent to the brain. Dr. Travell believed that the distorted perception caused by sternocleidomastoid trigger points were a hidden cause of falls and motor vehicle accidents.

Auditory disturbances—clavicular branch (figure 4.3). Clavicular trigger points can be a cause of unilateral deafness or hearing loss on the side where these trigger points exist. This is thought to be due to referred tension in the tiny stapedius and tensor tympani muscles that attach to the equally tiny bones of the middle ear. Tension in these little muscles could inhibit vibration in the inner ear. Massage of the jaw muscles and the sternocleidomastoids has been known to bring back normal hearing when trigger points were to blame for the problem (Simons, Travell, and Simons 1999). Tinnitus, or ringing in the ears, can also be caused by trigger points in the SCM, lateral pterygoid, or masseter muscle of the jaw.

Visual disturbances—sternal branch (figure 4.2). Sternal branch trigger points can cause dimmed, blurred, or double vision. You may have reddening and excessive tearing of your eyes, along with a runny nose. These trigger points can cause a drooping eyelid from a referred spasm in the orbicularis oculi muscle that surrounds the eye. Referred effects on the orbicularis muscle can also cause twitching of the eye or eyelid. The print on the page may seem to be jumping around when you read.

Systemic symptoms—both branches (figures 4.2 and 4.3). A sixth group of symptoms from sternocleidomastoid trigger points can include disturbed perception of the amount of weight carried in the hands, cold sweat on the forehead, and the generation of excess mucus in the sinuses, nasal cavities, and throat. They can be the simple explanation for your sinus congestion, sinus drainage, phlegm in the throat, chronic cough, and continual hay fever or cold symptoms. A persistent dry cough can often be stopped with massage to the sternal branch near its attachment to the breastbone (Simons, Travell, and Simons 1999).

Causes

The primary functions of the sternocleidomastoids are to turn the head side to side and flex the neck downward toward the chest. The *left* SCM turns the head to the *right* by bringing its attachment on the leftside of the skull around to the front.

The sternocleidomastoids also help maintain a stable position of the head during movements of the body. Trigger points can therefore be created by postures that keep the sternocleidomastoids contracted to hold the head in position—for example, looking at a computer screen or driving. Holding your head back to work overhead is particularly bad. Keeping your head turned to one side for any reason is sure to cause trouble. Trigger points in the lower half of the body, muscle imbalances, and postural dysfunction often distort posture to such an extent that the neck muscles must exhaust themselves in a constant attempt to compensate (Simons, Travell, and Simons 1999). Sometimes the lower body needs to be addressed before the muscles of the neck and upper back will

Migraine Headaches

Migraine headaches can be simple or complex with multiple factors, including but not limited to trigger points. If you need more help than this book offers subduing your migraines, please invest in the book *Migraine Brains and Bodies: A Comprehensive Guide to Solving the Mystery of your Migraines* by C. M. Shifflett. It addresses migraines from all perspectives: neurological, vascular, muscular, structural, and biochemical. It is a good resource for both clinicians and pain sufferers.

respond well to treatment. If you get a poor result with treatment to the upper back and neck, step back and look at the whole body. A well-trained professional therapist can help with this.

A single incident of heavy lifting can strain the sternocleidomastoids. Falls and whiplash accidents cause severe overstretching and overcontraction in all the muscles of the neck, including the sternocleidomastoids. Other conditions that encourage trigger points are other trigger points in the pectoralis major, a tight collar, a short leg, a curvature of the spine, emphysema, asthma, a chronic cough, hyperventilation, emotional stress, and habitual muscle tension. An auxiliary function of the sternocleidomastoids is to raise the breastbone when you inhale. Chest breathing can overwork them. Breathing from the belly (diaphragmatic breathing) protects the sternocleidomastoids and scalenes from overuse as accessory breathing muscles.

To avoid unnecessary stress to the sternocleidomastoids, don't sit for long periods with your head turned to one side, don't read in bed, and don't sleep on your stomach. Don't slouch when sitting on a couch or in a chair. Don't hold the telephone to your ear with your shoulder. Learn to breathe with your diaphragm, not with your chest. During normal breathing, your stomach should go in and out; your upper chest should not expand and contract much at all.

Treatment

The good news about the confusing conglomeration of symptoms generated by sternocleidomastoid trigger points is that you can fix them yourself in the simplest way.

One of the first rules of massage therapy is “never massage a pulse.” That simple rule will keep you out of trouble. First, let's locate the carotid artery so you can avoid massaging it. While sitting or lying down, use your fingertips to gently feel for the pulse on one side of your neck just under the jaw and to the outside of the windpipe. This place is okay to touch if done gently, but deeper pressure can potentially cause big problems. On both sides of the windpipe, this is the location of not only the carotid artery but also the carotid sinus with it. The carotid sinuses house baroreceptors that sense and regulate blood pressure. Massage or compression of one of the carotid sinuses can cause a sudden uncontrollable drop in blood pressure leading to dizziness, fainting, and falling. Aggressive pressure to other areas of the carotid arteries can loosen plaque and lead to a stroke. It is also possible that if one artery is blocked with plaque (arteriosclerosis) and you massage the opposite or good artery, you can cut off blood to the brain, also causing sudden dizziness, fainting, and falling. The body has multiple blood vessels that take blood to the brain just in case one is blocked or damaged, but it is always wise to avoid pressing on them. If you feel dizzy while checking your pulse or massaging this muscle, stop immediately and consult a doctor. If you cannot feel your own pulse because your fingers are not sensitive enough (due to calluses, diabetes, or lack of sensation), stay off the front of the neck.

While being cautious of the arteries, it is possible to massage this important muscle safely. After finding the carotid artery, simply replace the fingers with your thumb, move the thumb to the outside slightly, and grasp all of the tissue to the outside of the pulse. If you pinch the sternocleidomastoid, rather than press it against the side of the neck, you will stay off of the arteries. Treat only one side at a time and remain alert to the necessity of avoiding the pulse.

Turn your head to the opposite side while looking in the mirror, and you will see the sternal branch contract. Grasp it with your fingers and thumb in a pinch and turn your head back to a neutral position to relax the muscle for massage. Press only hard enough so that it feels comfortable as you try to discriminate between the two branches of the muscle. The sternal branch is superficial to the clavicular branch. Each is about as big around as your index finger. If you pay close attention, you should be able to feel them separately. To squeeze the deeper, or clavicular, branch, take a bigger grasp of the side of the neck. Many people make the mistake of moving their fingers too

Treatment Tips

First, gently identify and then avoid the pulse in the neck, as directed in the text.

Grasp this muscle with your thumb and fingers curled into a “C” shape rather than straightened in a “V” shape. You should use only the tips of your fingers.

Milk the SCM with short, repeated up-and-down strokes. Lighten your pressure if you slip off and strum the muscle.

Keeping your face looking forward, tilt your head slightly down and to the same side as you massage the SCM.

The first rule of massage therapy is “never massage a pulse.”

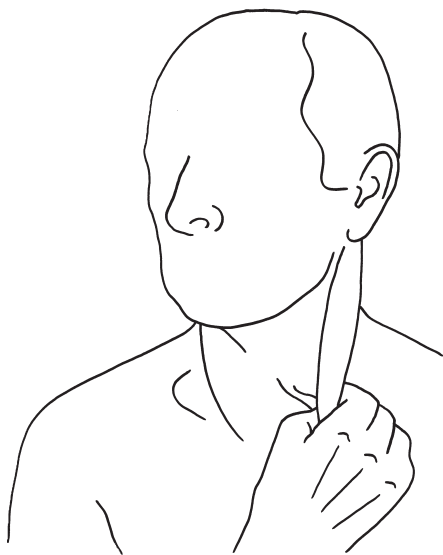


Figure 4.4

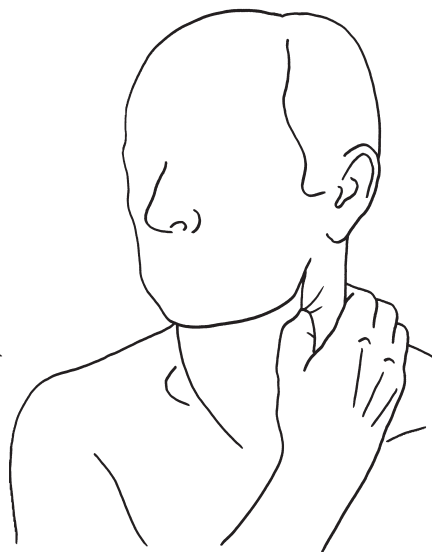


Figure 4.5



Figure 4.6

Sternocleidomastoid massage between fingers and thumb (Important! Read “Treatment” section first.)

far back to include the back of the neck. Think of the clavicular head as “deep to” not “behind” the sternal branch. To make sure you are still on the SCM, turn your head to the opposite side again. The SCM is nearly everything you can pinch on the side of your neck. As you pull forward with your grip, you will roll off the deep branch. As you do this you may be able to feel a slight trough between it and the superficial, or sternal, branch. After popping off the sternal branch, you will feel only skin and the platysma muscle. To search for trigger points in each branch, start in the middle and work your way up behind your earlobe, and then all the way down to your collarbone (figures 4.4, 4.5, and 4.6). Use your same side hand to best access the deeper clavicular branch. As you work, your other arm can support your elbow and make this technique easy and relaxing.

If your sternocleidomastoid muscles hurt when squeezed, they’re almost certain to be involved in that chronic headache or whatever other symptom you may be having in your head, face, or jaws. When sternocleidomastoid trigger points are bad enough, a little squeeze will actually reproduce or accentuate a frontal headache, giving you a very convincing demonstration of what trigger points do.

Don’t be afraid of these muscles. They may be very tender to massage initially, but you can’t do them any harm. To the contrary, every gentle squeeze you give them will be of benefit. It may seem like a dumb idea to massage such tender areas. Just go easy at first, and work at a pressure level that feels good, or “therapeutically delicious.” Your symptoms may disappear in a very short time, but continue working the trigger points repeatedly and patiently over several days until you can no longer find a place that hurts. Sternocleidomastoid massage often makes a headache better almost immediately. The same is true for dizziness and many other sternocleidomastoid symptoms.

Trapezius

The word *trapezius* (truh-PEE-zee-us) comes from the Greek word for “small table,” a reflection of the muscle’s relative flatness and four-cornered shape. Although the trapezius is located on the upper back and functions mainly to move the shoulder, it appears in this chapter because its trigger points are a primary source of headaches and neck pain.

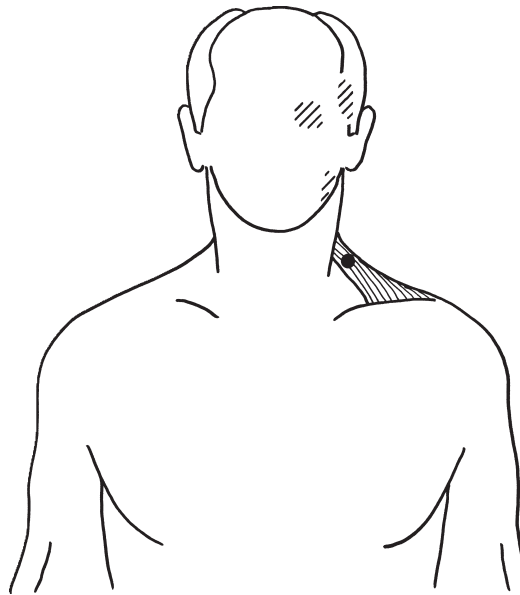


Figure 4.7 Trapezius number 1 trigger point and referred pain pattern: front view

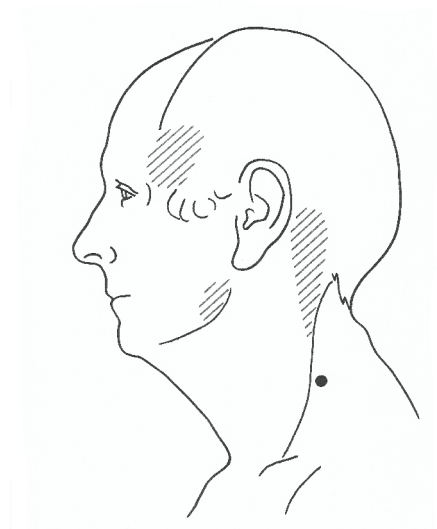


Figure 4.8 Upper trapezius number 1 trigger point and referred pain pattern: side view

Symptoms

Trapezius number 1 (figures 4.7 and 4.8) is located in the very topmost fibers of the thick roll of muscle on top of the shoulder. It's not deep in the body of the muscle. Most people can find it only by pinching a tiny roll of tissue right where the shoulder joins the neck (the angle of the neck). On heavier or more muscled bodies, this roll of muscle can be as big as a magic marker. Nearly everyone has trapezius number 1 trigger points. It's the primary cause of a temple headache but may also send pain to the masseter muscle at the angle of the jaw, up the side of the neck behind the ear, and deep behind the eye. Occasionally, pain occurs in the back of the head and in an arch over the ear (not shown). Their effects are most often identified as a tension neck ache. This point can restrict rotation and sideways flexion of the head to the opposite side. Additionally, it's capable of inducing satellite trigger points in muscles in the temple and jaw, making it an indirect cause of jaw pain and toothache (Simons, Travell, and Simons 1999).

Trapezius number 2 (figure 4.9) is actually a pair of trigger points an inch or two apart deep in the roll of muscle on top of the shoulder. You may have either one or both. These two are a primary cause of pain in the back of the neck and the base of the skull, which may be felt as either a headache or a sore neck. This referred pain very often induces satellite trigger points in the muscles of the back of the neck. When neck massage feels good but doesn't get rid of the pain, the problem may be in the trapezius muscles, not in the neck. This point can also restrict rotation and sideways flexion of the head to the opposite side.

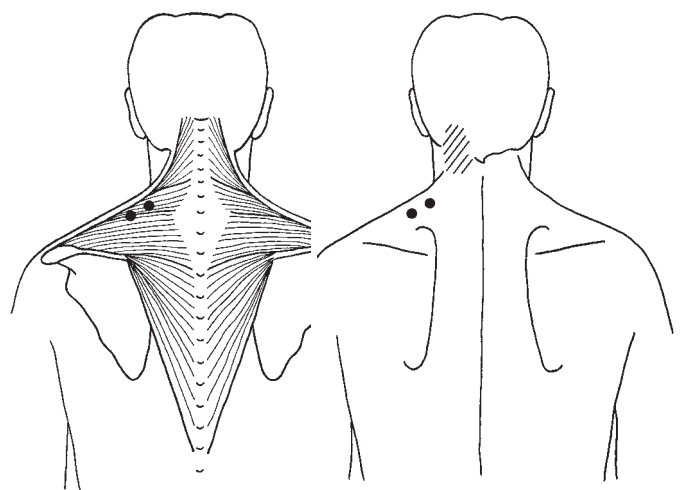


Figure 4.9 Upper trapezius number 2 trigger points and referred pain pattern

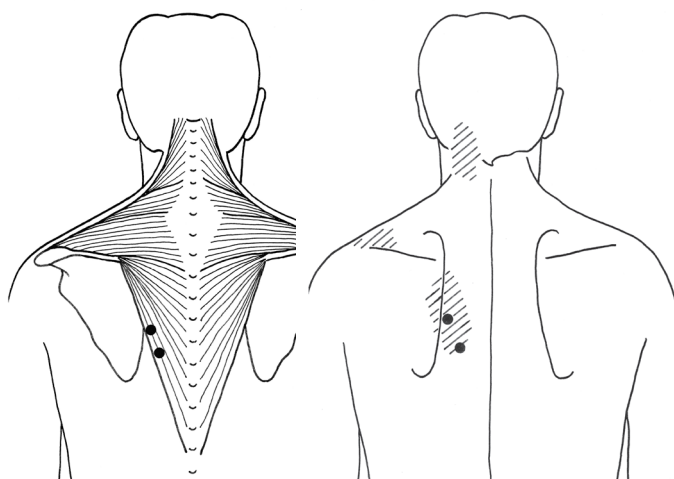


Figure 4.10 Lower trapezius number 3 trigger points and referred pain pattern

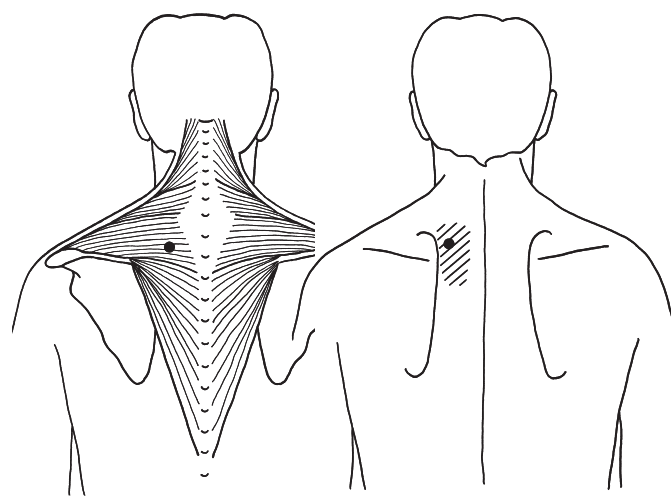


Figure 4.11 Trapezius number 4 trigger point and referred pain pattern

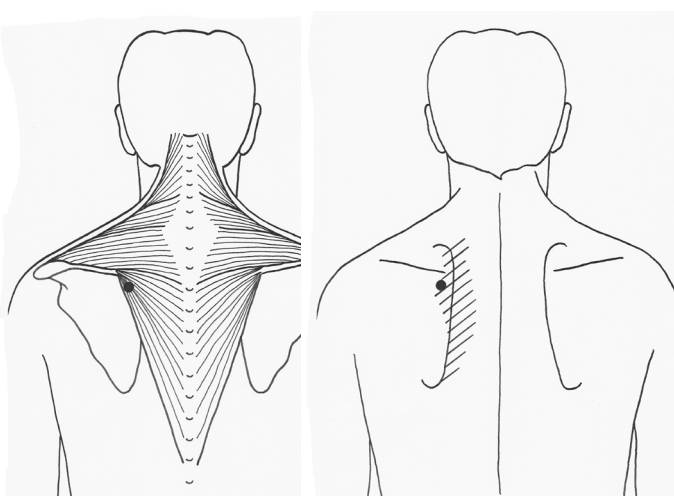


Figure 4.12 Middle trapezius number 5 trigger point and referred pain pattern

Trapezius number 3 (figure 4.10) trigger points can be found along the inner (or medial) border of the shoulder blade, just down from where the edge of muscle crosses onto the shoulder blade, about halfway up from the inferior angle.

The upper trigger point is an extremely common primary trigger point. It refers pain to back of the neck and base of the skull like the trigger points in the upper trapezius. It's one of the many causes of a stiff neck. It can also send referred pain to the upper trapezius itself. Satellite trigger points produced in these two places can in turn be the cause of headache. This cascade, or domino effect, of myofascial trigger points is one reason headaches have been so hard to understand and treat effectively. The lower point can also cause an oppressive ache or burning pain in the midback and an aching pain in the top of the shoulder. This top of shoulder pain can also be coming from local trigger point number 6 (see figure 4.13). When trigger points weaken the lower trapezius muscles, they may contribute to making the shoulder blades stick out in back, a condition called "winging" (Simons, Travell, and Simons 1999).

Trapezius number 4 (figure 4.11) trigger point is located on the shoulder blade itself, overlying the infraspinatus muscle. This trigger point can create an aching pain just off the inner edge of the shoulder blade.

Trapezius number 5 (figure 4.12) trigger point occurs next to the inner border of the shoulder blade in the broad middle part of the trapezius. It causes a burning kind of pain nearby, alongside the spine. Superficial trigger points in this area can cause goose bumps on the back of the upper arm and sometimes, oddly, on the thighs (Simons, Travell, and Simons 1999).

Eventually you will feel so good that you will begin to forget to do your self-care. This is a good sign but watch out. The pain may come back because of unreleased latent trigger points.

Trapezius number 6 (figure 4.13) is a trigger point located on the upper shoulder at the acromion, the outer part of the shoulder blade. This point may be over trigger point 1 in the supraspinatus muscle or can appear independently. Note that this trigger point causes local pain and can be a satellite of the lower trapezius number 3 point.

The symptoms generated by trapezius trigger points are widely misinterpreted, producing a whole catalog of misdiagnoses and misdirected treatments. You may be told your symptoms are from spinal disk compression, spinal stenosis, bursitis of the shoulder, or neuralgia. Headaches caused by trapezius trigger points may be labeled as tension, cervicogenic, vascular, cluster, or migraine when their true cause is not understood. Although there are serious medical causes of headaches, an examination for trigger points should be near the top of any doctor's list (Simons, Travell, and Simons 1999).

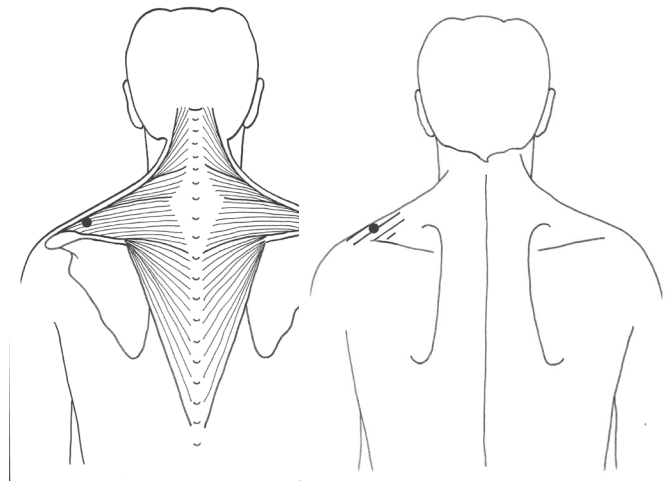


Figure 4.13 Upper trapezius number 6 trigger point and referred pain pattern

Causes

The trapezius covers most of the upper half of the back, extending upward to cover the central part of the back of the neck. This uppermost part of the trapezius is what gives the back of the neck its shape. The muscle attaches to the base of the skull, the spine, the collarbone, and the shoulder blades. The trapezius supports the weight of the shoulders and must contract strongly to rotate the shoulder blade every time you raise your arm above shoulder height. Another primary function is to hold the shoulder blade solidly in place as a base for the finer operations of the arm and hand.

The uppermost part of the trapezius helps support the weight of the head and neck when you bend your head forward or to the side. It also contracts when you raise the shoulder toward the ear or the ear down to the shoulder, as when lying down on the opposite side. Faulty posture, such as slouching while seated or habitually carrying your head forward, places an unnecessary burden on your trapezius muscles, generating trigger points. Shortened pectoral muscles, indicated by a round-shouldered posture, exert a steady pull on the shoulders that the trapezius muscles must constantly counteract. This can perpetuate an overstretched and weakened trapezius that is susceptible to developing satellite trigger points from the mechanical strain produced by short, tight pectoral muscles. Shortened abdominal muscles can also pull the torso down, creating a rounded-shoulder, forward-head posture. The trigger points in the rectus abdominis can thus be the primary points leading to a headache! Sounds crazy doesn't it? Massage and stretch your abdominal and pectoral muscles to treat your headache if the trapezius massage does not give you lasting relief.

Trigger points are produced in all parts of the trapezius by a job that requires working with the arms held out in front of the body for extended periods of time. You subject your trapezius muscles to constant strain when you sit without elbow support. At the computer or any other desk job, use a chair with arms whenever possible. It's not enough to rest your arms on the desk. Heavy-breasted women may be especially vulnerable to any of the many trapezius symptoms. The strain of supporting heavy breasts can make trapezius trigger points hard to get rid of. Carrying a heavy backpack or a heavy purse hanging from a shoulder strap can be the simple explanation for that recurring migraine or chronically stiff neck (Simons, Travell, and Simons 1999).

Another common cause of trapezius trigger points is the emotional tension that keeps your shoulders up. It is a good practice to purposefully let your shoulders drop down multiple times during the day. Put a sticky note where you can see it to remind you. Chapter 12, *Muscle Tension and Chronic Pain*, has a systematic approach to conscious relaxation that you incorporate into your daily life.

Treatment

Trapezius number 1. It's important to understand that trapezius number 1 in the angle of the neck is often found right under the skin. The taut band that contains the trigger point feels like a knitting needle between your fingers.

Treatment Tips

To make the upper trapezius easier to get ahold of, loosen it by putting your hand in your pocket or waistband.

Tilt your head to the same side while massaging to relax this muscle.

Use the Thera Cane through a layer of clothing.

Rest your elbows on a desk or table as you reach across the body to massage the trapezius.

It usually takes only a shallow pinch to take hold of it for most folks. Heavily muscled and generously proportioned people will find this trigger point in a larger denser roll of muscle as big as a magic marker at the same junction. Using your opposite hand, massage the trapezius by rolling it between your thumb and first two fingers (figure 4.14). A good, strong squeeze of trapezius number 1 may reproduce or accentuate a temple headache, which verifies it as the cause. Virtually everyone has this trigger point, and it causes an incredible amount of grief. If this technique is too hard on your hands, try using a modified pinch with a ball against a wall (figure 4.15).

Trapezius number 2. These two trigger points (figure 4.9) can also be pinched using the opposite hand. Make sure your thumb is in front of and beneath the big roll of muscle at the top of your shoulder. In other words, pinch with a big bite from the very front, about an inch above the collarbone. The first, more medial, point is right in the middle, while the second, or lateral, point is an inch or two more toward the outside. Remember that medial means toward the midline and lateral means toward the outside of

the body. The medial point is deeper into the body and requires a bigger pinch than the trapezius number 1 point. To find and treat the outer trigger point, search further laterally toward the shoulder using a pinching motion. Go across the trapezius until you run into the collarbone with your thumb. Keep the thumb there, just inside the collarbone, and with it dig up and outward underneath the roll of trapezius. The fingers will meet the thumb from the other side with a pinch. You will be massaging into the front of the trapezius just before it attaches laterally to the collarbone. The muscle will feel thick and dense here.

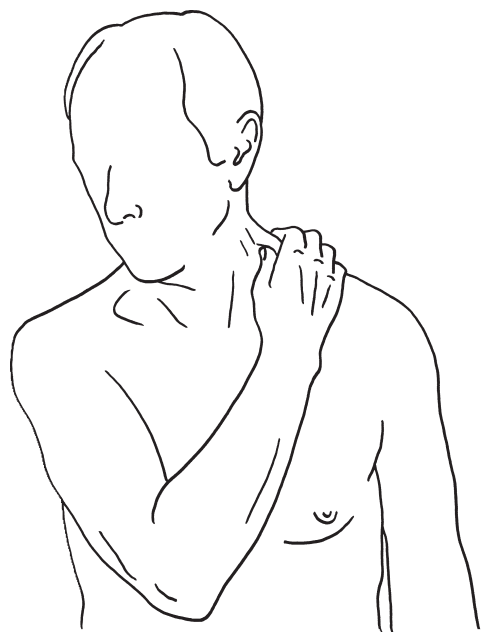


Figure 4.14 Massage of trapezius number 1 with fingers and thumb

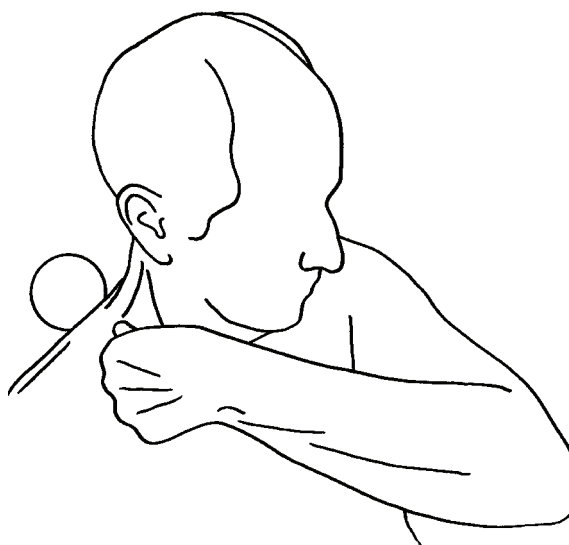


Figure 4.15 Trapezius number 2 massage with supported thumb against a ball on a wall or bed

If massage with fingers and thumb is too tiring for your hand, try pressing the upper trapezius trigger points against a ball on the wall with a supported thumb, fingertips, or pointed massage tool (figure 4.15). Any of the trapezius trigger points can be massaged with the Thera Cane, Backnobber, Body Back Buddy, or any hook tool. Figure 4.16 shows how to hold the Thera Cane for massage of trapezius number 2. Maximum pressure and control are obtained when the hand opposite of the side being massaged is in the bow of the cane. This also allows the muscle you are treating to relax. The bottom of the cane is angled across the body, toward the opposite hip. This allows you to keep your head straight rather than tilted away from the tool. See figure 4.21 to see the ideal position of the hands. If you don't have a hook-type tool, lean forward against a door frame or convex corner to place the ball on the top of your shoulder (figure 4.17). Review the massage guidelines given in chapter 3 (see table 3.1) to be sure that you clearly understand how to correctly execute the massage stroke.

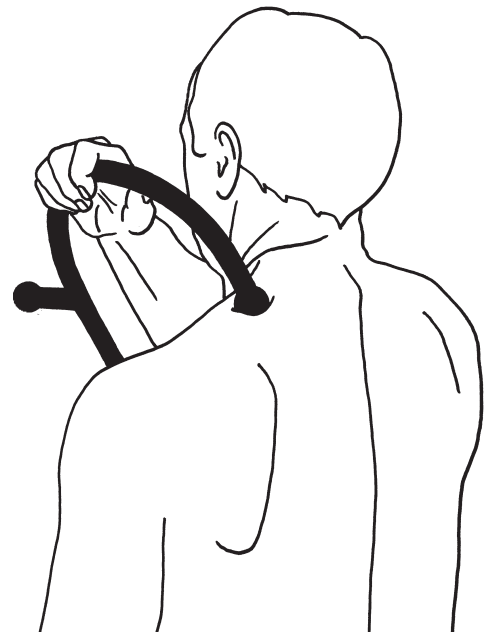


Figure 4.16 Trapezius number 2 massage with Thera Cane

Trapezius number 3. Leaning against a ball (tennis ball size) on a wall is especially effective for trigger point number 3 in the lower trapezius (figure 4.18). Notice that you have a choice of two directions to move the ball: up the back or across it

Don't try to kill the trigger points. Just improve the circulation. Let your body do the healing.

toward the spine. Moving up along the edge of the shoulder blade, you may feel the ball bump as it goes over the diagonally oriented edge of the muscle. Moving across from the shoulder blade onto the back, it feels like you're pushing the muscle ahead of the ball. There's likely to be more than one trigger point at this site, one on each side of the edge of the shoulder blade.



Figure 4.17 Treating upper trapezius number 2 with a ball on a corner or doorway

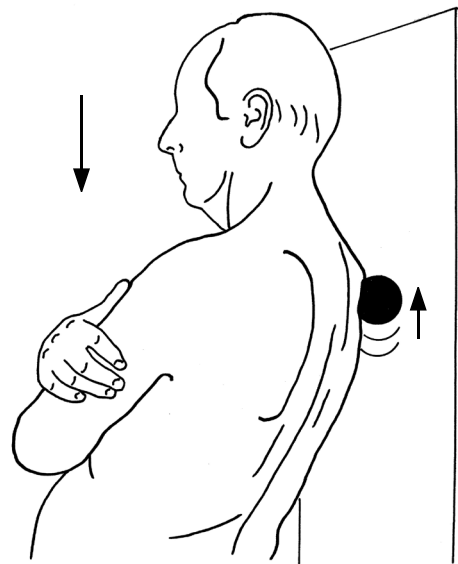


Figure 4.18 Massage of lower trapezius number 3 with a ball on a wall

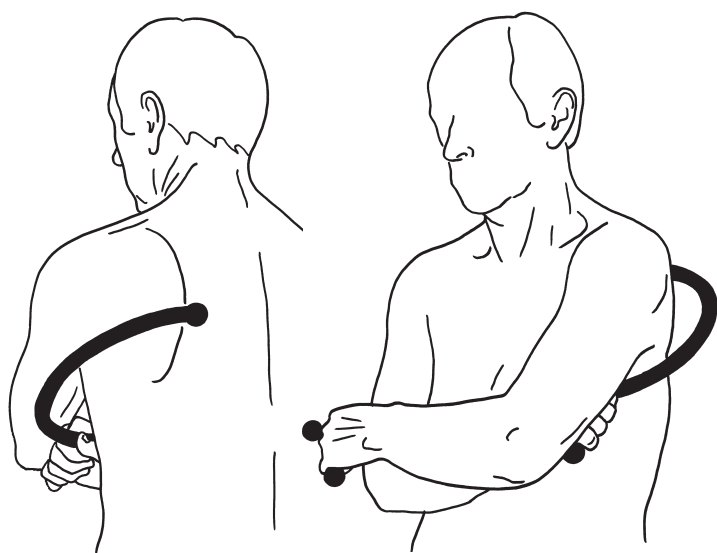


Figure 4.19 Trapezius number 3 massage with Thera Cane

A hard rubber ball such as a high bounce ball or a lacrosse ball will offer deeper pressure. Figure 4.19 shows the position of the Thera Cane for massage of this trigger point. Trapezius trigger points should be massaged three to six times a day for best results, but limit the session to ten to twelve strokes per trigger point. Don't try to kill them. Just improve the circulation. Let your body do the healing.

A detailed description of how to use the ball-against-the-wall technique is included in chapter 8, in the treatment section "Superficial Spinal Muscles."

Levator Scapulae

The *levator scapulae* (luh-VAY-ter SCAP-yuh-lee) is another hardworking muscle that everyone has trouble with. "Levator" is from the same Latin root as "elevator." "Scapula" is Latin for "shoulder blade." The name tells its job: it lifts the shoulder blade. (In common usage, "levator scapulae" is often pronounced as though it were spelled "levator scapula.")

Symptoms

Trigger points in levator scapulae muscles cause pain and stiffness in the angle of the neck and upper back (figure 4.20). When sufficiently active, they also refer a lesser degree of pain along the inner edge of the shoulder blade and to the back of the shoulder (not shown). A levator scapulae trigger point is what keeps you from turning your head to look behind you when you're backing up in your car. You may not be able to turn your head at all toward the side that has the trigger point. Turning your head to the opposite side may also cause pain (Simons, Travell, and Simons 1999).

Causes

The lower end of each levator scapulae muscle attaches to the inner edge of the top angle of the corresponding shoulder blade. Its upper end attaches to the sides of the top four neck vertebrae (figure 4.20). This arrangement allows the levator scapulae to help raise the shoulder blade and thereby raise the shoulder. This function is the very one that gets the muscle into trouble. When stress and bad posture habits keep your shoulders up, you can be sure that the levator scapulae muscles are doing much of the work.

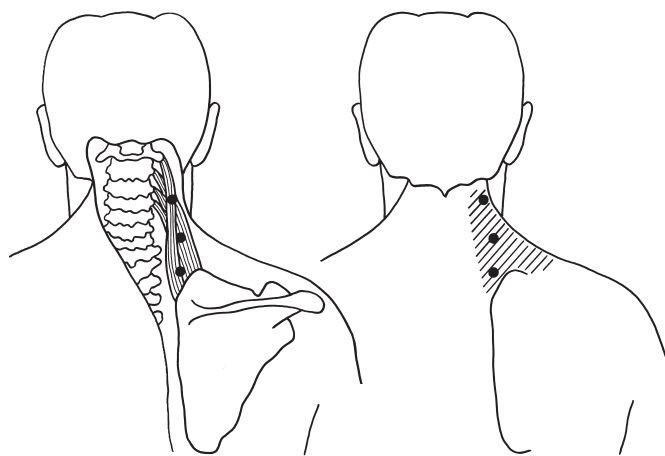


Figure 4.20 Levator scapulae trigger points and referred pain pattern

Many things can make trouble for the levator scapulae, including sleeping on your side without support for your head, typing while looking at your copy out to one side, sitting in a draft of cold air, and holding the phone clamped between your head and shoulder. Backpacks and purses suspended from shoulder straps are as bad for levator scapulae muscles as they are for the trapezius. Both have to stay strongly contracted to counter the downward pull.

Levator muscles are also stressed by overexercise, emotional tension, and armrests that are too high or too low. The levator is one of many muscles that are strained by whiplash. Trigger points set up by an auto accident or a fall can persist undetected for years, the unknown sources of chronic pain and disability (Simons, Travell, and Simons 1999).

As a pair, the levators serve as a checkrein for the head when it hangs forward. They are consequently severely abused by habitually carrying the head forward. Levator scapulae and trapezius muscles can be strained beyond endurance by habitually reading with your book or e-reader flat on the desk, since all the muscles of your neck and upper back have to remain contracted all the time your head is hanging forward in that position. Prop your book up with a couple of other thick books when you read so you can keep your head up. E-readers really need an accessory such as an incline case that will allow the device to be used at an angle. Several styles of book stands can be found in any college bookstore or online. Habitually interacting with a cellphone or smartphone held at chest level will also wear out your levator scapula muscles. Periodically lift your shoulders up toward your ears and then stretch them down to allow these muscles to fully contract and then stretch. This will help avoid trigger points when your smartphone is too much fun to put away.

Treatment

The most accessible levator scapulae trigger point is located just above where the muscle attaches to the upper angle of the shoulder blade. To find this place accurately, you must first be able to locate the upper, or superior, angle. To feel the superior angle move under your fingers, place the heel of your hand on your opposite collarbone (see figure 5.11). Let the fingers lie relaxed across the top of your body. Glue the hand here and don't let it move down your back. Now swing your free arm loosely forward and back. As you do the movement, you will feel the underlying superior angle of the shoulder blade bump up under your index or middle finger. Using your hand, you won't be able to effectively massage the trigger point that is located just above the angle here. To be most successful, use a Thera Cane, Backnobber, or other hook-type tool. Replace your fingers at the superior angle for the knob on the hook end of the tool. Apply pressure or do a tiny moving stroke across the sore trigger point found just above the angle. See figure 4.21 for the hand position and figure 4.22 for specific treatment of the lowest levator scapulae trigger point. A description of how to use the cane tools can be found in the treatment section of trapezius number 2 above.

Unfortunately, the lowest trigger point in the levator scapulae isn't the one that causes most of the trouble. It is good to work this spot, but it may not get rid of all your neck pain and stiffness. The middle (central) trigger point is an important one to go after. It can be found at the base of the neck just in front of the upper trapezius. Reach across the front of your neck with your opposite hand. Place your fingertips right in the middle of the angle where the neck meets the body. Press your middle finger into the base of your neck just in front of the trapezius, which is the big muscle you can feel contract when you raise the shoulder. If you strum forward to back here, you might feel a tight rope of muscle going up the side of your neck. Press this rope-like band into the underlying transverse process (side of the underlying vertebrae) at the very base of the neck. If you don't find it at first, allow for a careful search for this very tiny point. It may surprise you that the knobby hard bumps there under your fingers are the bones of your neck. You won't likely feel knots, only tight muscles and bone. You can

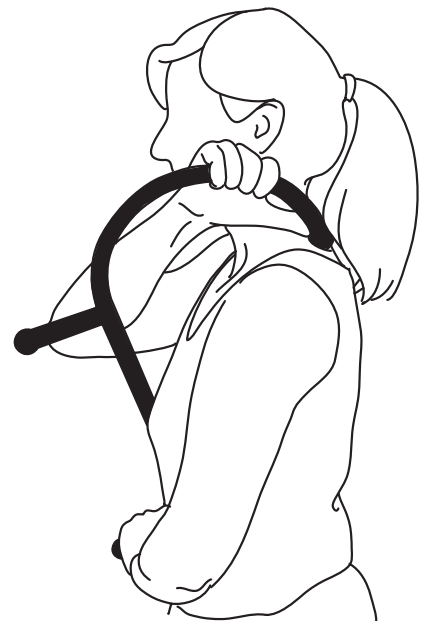


Figure 4.21 Position of hands and Thera Cane for treating upper back muscles



Figure 4.22 Treating lower levator scapulae trigger point with a Thera Cane



Figure 4.23 Treating middle levator scapulae trigger point with a Thera Cane

massage this point with your fingertips. Support the tool hand with the other hand for additional pressure. A Thera Cane or Backnobber also works well (see figure 4.23). If you don't have a hook-type tool, lean forward against a door frame or convex corner to place the ball on the top of your shoulder (figure 4.17). Leaning into a ball on a wall behind you also works for the lower point. Don't neglect the highest trigger point, high on the side of the neck, just behind the top of the sternocleidomastoid muscle. Work it with supported fingers or a hook-type cane.

Muscles of the Back of the Neck

Except for the suboccipital muscles, which constitute a special class, four layers of muscle cover the back of the neck. Picture the plies of a tire: the outer layer is the uppermost part of the upper trapezius; the three deeper layers carry the inevitable Greek-derived and Latinate names that variously describe them or give a clue to their function.

Immediately under the trapezius lie the thin, flat splenius muscles, which cover the others like thin straps. The word “splenius,” in fact, derives from the Greek word for “bandage.” Then come the semispinalis muscles, running nearly parallel to the spine, as the name suggests. Underneath everything else are the rotatores and multifidi, a multitude of very short muscles that interconnect the neck vertebrae and help rotate the neck and bend it to the side. “Multifidi” literally means “split into many parts.” Each muscle and its symptoms, causes, and specific palpation will be discussed below. At the end of the section, a general treatment section will describe treatment techniques for all back-of-the-neck muscles.

Splenius Capitis

Splenius capitis (SPLEE-nee-us CAP-uh-tiss) muscles are broad straps connecting the neck vertebrae to the back of the skull. Their diagonal orientation makes them a major force in turning the head. These muscles also extend the head back.

Symptoms

Splenius capitis trigger points refer pain to the top of the head (figure 4.24) and are a common cause of headache (Simons, Travell, and Simons 1999; Jaeger 1989).

Causes

The causes of trigger points in the back of the neck are the same kinds of abuse and overuse listed for the trapezius and levator scapulae. Whiplash injuries, forward-head posture, emotional tension, postural stresses such as turning your head to read something placed to the side, and sitting under a cold draft are some of the most common activators of trigger points in the neck. Splenius capitis is commonly injured in motor vehicle accidents. Pulling a rope or lifting too much weight can activate trigger points in this muscle.

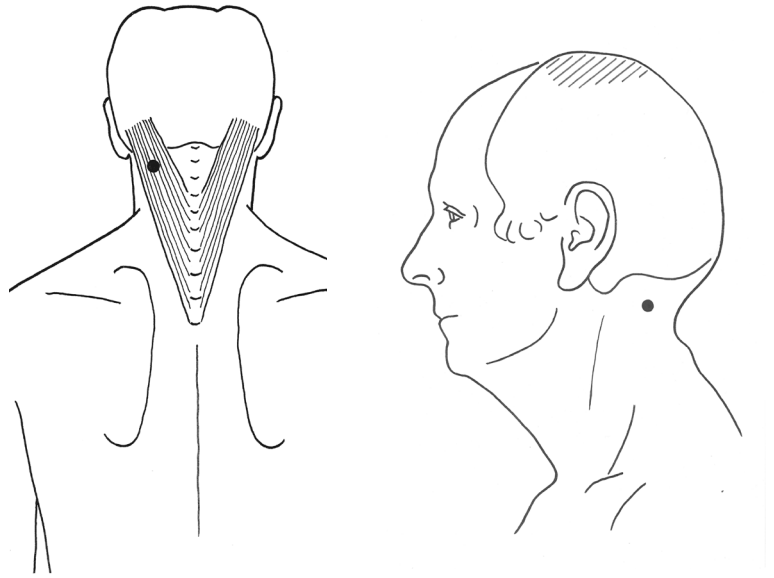


Figure 4.24 Splenius capitis trigger point and referred pain pattern

Palpation Tips

With the head in neutral, the trigger point is about an inch below the skull and an inch lateral (to the outside) of the *spinous processes* (the bony bits of your spine). To feel the splenius capitis contract, place your fingers just below the skull and behind the sternocleidomastoid (SCM) muscle (see the SCM section for palpation tips). Turn your head to the same side you seek to treat. Tilt your head back slightly against the resistance of your other hand, which should be placed on the back of the skull. Follow this muscle downward about an inch and slightly toward the spine to find the trigger point. Treat it with any of the suggested methods detailed at the end of the neck muscles section.

Splenius Cervicis

Splenius cervicis (SPLEE-nee-us SUR-vuh-sis) muscles connect the vertebrae of the upper back to those of the neck. Their job is to move only the neck, not the head. Side bending, extension, and rotation of the neck are all actions of this muscle.

Symptoms

Splenius cervicis number 1. Upper trigger points cause pain that begins at the base of the skull and runs forward through the head to the back of the eye (figure 4.25). It feels like a pulsating ache inside

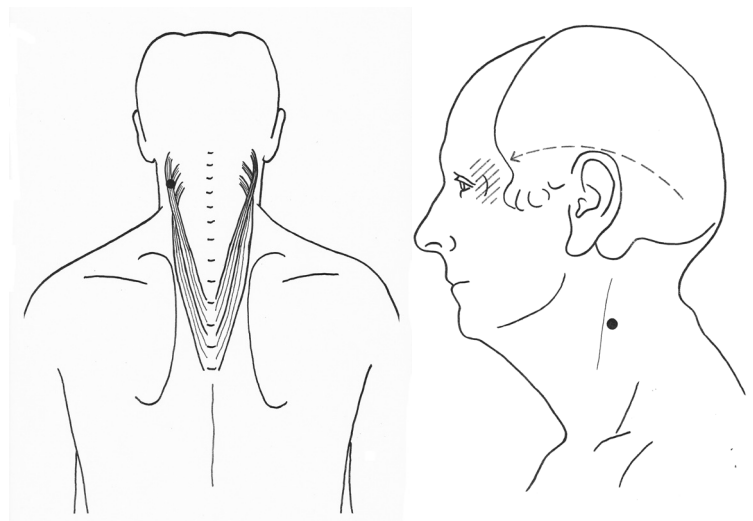


Figure 4.25 Splenius cervicis number 1 trigger point and referred pain pattern: through the head like a spear to the back of the eye

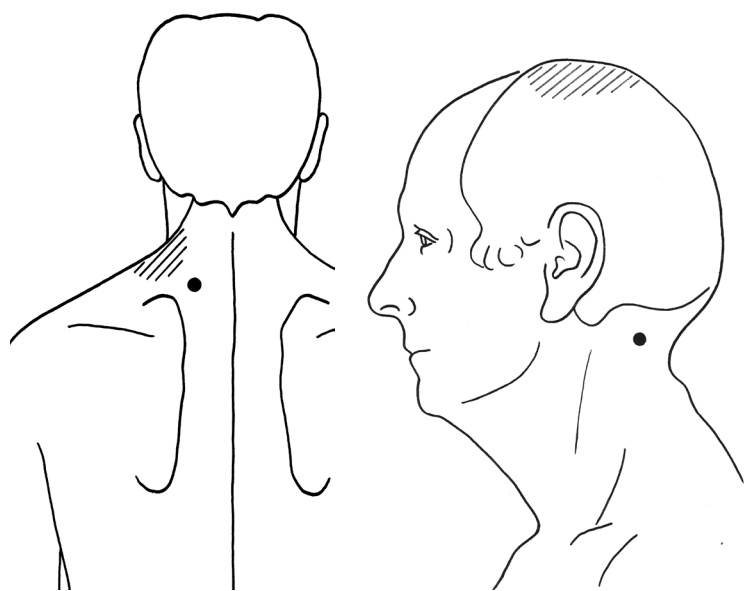


Figure 4.26 Splenius cervicis number 2 trigger point and referred pain pattern

the skull or in the eye. This is the familiar pain behind the eye felt during migraine headaches. This trigger point is capable of blurring your vision.

Splenius cervicis number 2. Trigger points in the lower splenius cervicis refer pain to the angle of the neck (figure 4.26). Trigger point number 2 is often activated with the levator scapulae trigger points. The upper and lower splenius cervicis trigger points can cause both numbness and pressure in the back of the head (Simons, Travell, and Simons 1999; Graff-Radford, Jaeger, and Reeves 1986).

Causes

Trigger points can develop as a result of postural stresses including lounging with your head propped at an angle against the arm of the couch

instead of supported by a pillow, pulling excessive weight, or sitting in a cold draft, such as from an air conditioner. Forward-head posture and whiplash injuries are also common causes.

Palpation Tips

Splenius cervicis number 1. You will find this trigger point about halfway down the left and right sides of your neck, straight down from the ear. Compress it against the side of the neck at about the third cervical vertebrae with your fingers (figure 4.27).

Splenius cervicis number 2. This trigger point is more medial (or toward the midline) from the lower levator scapulae point at the superior angle. Use a ball against a wall or a Thera Cane (figure 4.28) to press deeply through

the trapezius and spinal erector muscles to compress this point against the underlying vertebrae.



Figure 4.27 Locating and treating splenius cervicis number 1 with fingers



Figure 4.28 Locating and treating splenius cervicis number 2 with the Thera Cane

Semispinalis Capitis

Semispinalis capitis (seh-mee-spih-NAH-liss CAP-uh-tiss) muscles connect the vertebrae of the upper back and lower neck to the base of the skull. Because of the segmented construction of this muscle, trigger points may be found anywhere along its length.

Symptoms

Semispinalis capitis number 1 trigger points cause a spot of pain in the temple and sometimes a band of pain that encircles half the head just above the ear (figure 4.29).

Semispinalis number 2 trigger points refer pain to the back of the head (figure 4.30). Trigger points in semispinalis capitis and trapezius muscles can cause pressure on the greater occipital nerve, which is a sensory nerve for the back of the head. This entrapment of the nerve can be the source of numbness, tingling, and burning pain in the scalp of the back of the head. With this problem, you can't bear the pressure of your head on a pillow (Simons, Travell, and Simons 1999). Resolve this trigger point before buying a new pillow.

Causes

Acute trauma such as a car accident or striking the head on the bottom of a swimming pool can cause trigger points in the semispinalis capitis. Other causes include poor posture while seated reading at a desk, forward-head posture, or lying down on your side with your head propped on your hands to watch TV. Primary trigger points in the trapezius and splenius capitis will create satellite trigger points in these muscles.

Palpation Tips

The higher of the trigger points is about an inch above the edge of the skull. The second point is about an inch below the skull. It overlies the deeper ones in the suboccipitals. The lowest point in the semispinalis capitis muscle is low on the neck, just an inch to the outside of the bony spinous processes. Treatment techniques can be found at the end of the neck section.

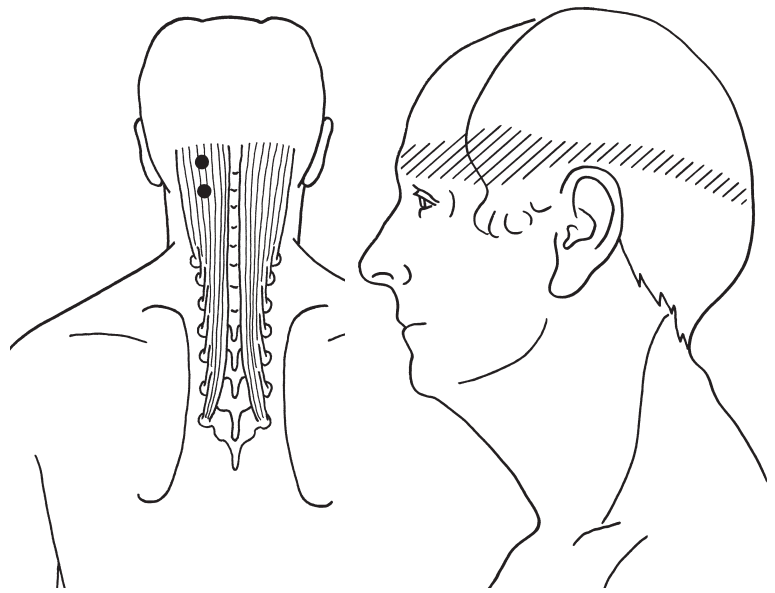


Figure 4.29 Sample semispinalis capitis number 1 trigger points and referred pain pattern

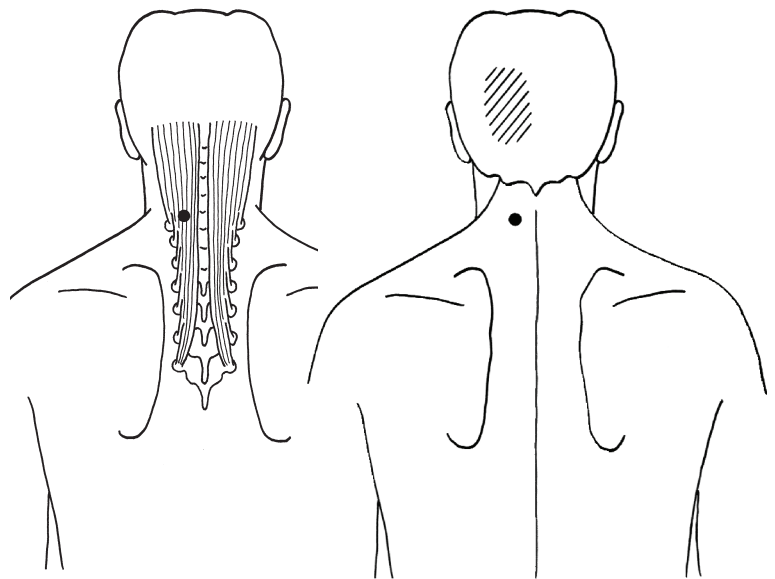


Figure 4.30 Sample semispinalis capitis number 2 trigger point and referred pain pattern

Multifidi and Rotatores

The *multifidi* (mul-TIH-fih-dee) and the *rotatores* (ro-tuh-TOR-eez) are the deepest of the neck muscles. Dozens and dozens of these tiny muscles run from vertebra to vertebra at a variety of angles and are important for the finer, more controlled movements of the neck and head.

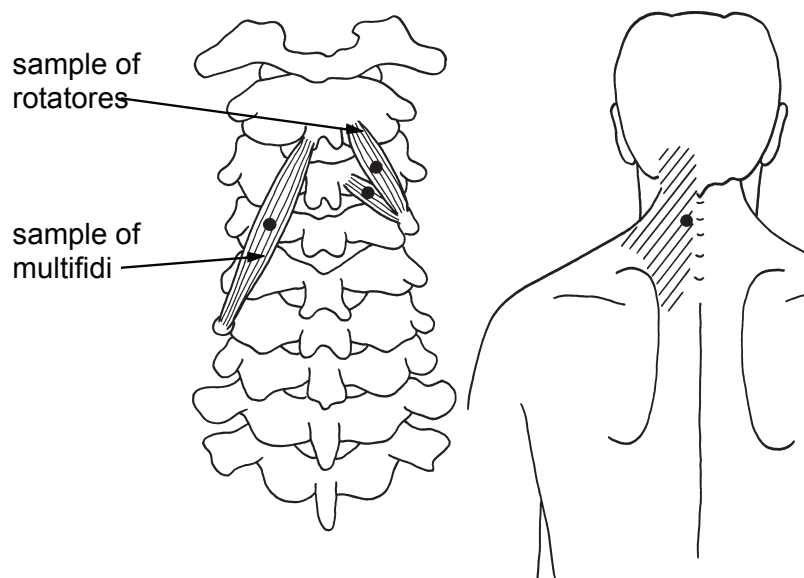


Figure 4.31 Multifidi and rotatores trigger points and referred pain pattern

Multifidi and rotatores trigger points cause intense pain at the site of the trigger point, which usually spreads up or down the spine over several vertebrae (figure 4.31). Pain may be felt as far away as the top of the shoulder and the inner edge of the shoulder blade.

Pain from the multifidi and rotatores feels like it's in the spine itself and is often misinterpreted as resulting from disk compression or disarticulation (subluxation) of the vertebrae. When subluxation, or partial dislocation, does occur, it may be caused by extreme tension in one of these small muscles, which pulls the vertebra to one side (Simons, Travell, and Simons 1999). You may find that your chiropractic adjustments hold better after trigger point massage.

Multifidi and rotatores trigger points may occur at any level in the neck. Right next to the spine press into the *lamina groove*, which is the small space between the palpa-

ble spine bone (spinous process) and the next muscle, the semispinalis. Massage them against the vertebrae with supported fingers (figures 4.37 and 4.38). If you can't reach them with your hands, use a ball while lying on your back (figure 4.36).

Suboccipital Muscles

The *suboccipital* (sub-ahk-SIH-pih-tul) muscles are located right below the base of the skull; the *occiput* is the back of the head. The suboccipitals consist of four small muscles on each side, each running at a different angle, connecting the top two vertebrae to the skull and to each other (figure 4.32).

Symptoms

Suboccipital trigger points cause pain that feels like it's inside the head, extending from the back of the head to the eye and forehead (figure 4.33). It feels like the whole side of the head hurts. This sensation is typical of what you experience with a migraine headache (Simons, Travell, and Simons 1999). The upper three suboccipitals on each side control nodding and tilting and, if afflicted with trigger points, can limit these movements and cause a stiff neck. The lowest of the suboccipitals, the *obliquus capitis inferior*, connects the top two vertebrae

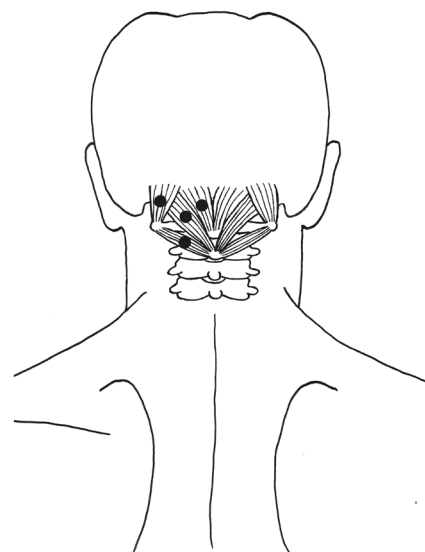


Figure 4.32 Suboccipital muscles trigger points

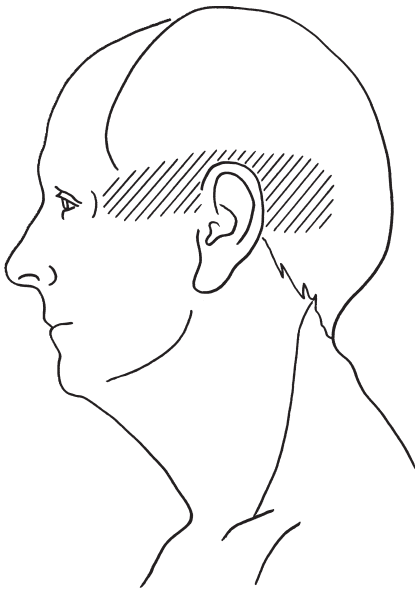


Figure 4.33 Suboccipitals referred pain pattern

these muscles to contract, which may be the physical connection between worry and migraine headaches. Trapezius trigger points also contribute to migraine by creating satellite trigger points in the suboccipitals and other back-of-the-neck muscles (Simons, Travell, and Simons 1999).

Palpation Tips

The suboccipitals are the most deeply situated of all the neck muscles. The top two points will be compressed up and into the base of the skull. The four suboccipital muscles on each side attach the first two vertebrae to the skull. Notice how the outer three muscles make a triangle on each side of the neck. This is called the “suboccipital triangle.” Deep to this space is a vulnerable vertebral artery that can, in rare cases, be damaged by deep massage. These arteries supply the brain. Damage can lead to a stroke or other complications. To avoid this artery, carefully follow the directions in the next section, “Treatment of All Back-of-the-Neck Muscles.”



Figure 4.34 Do not use a deeply penetrating tool such as a Thera Cane to massage just below the base of the skull. It is possible to rupture the vertebral artery. Please read the text for specific directions.

where, most of the rotation of the head occurs. This little muscle's trigger points restrict rotation and cause sharp pain high on the side of the neck when you've turned your head as far as it will go. This special muscle can be most effectively worked with the very tips of your fingers.

Causes

The causes of trigger points in the back of the neck are the same kinds of abuse and overuse listed for the trapezius and levator scapulae. Whiplash injuries, forward-head posture, emotional tension, postural stresses such as turning your head to read something placed to the side, and sitting under a cold draft are some of the most common activators of trigger points in the neck.

Suboccipital muscles can be quickly exhausted by frequently moving the head or by any prolonged contraction. Emotional tension causes

Treatment Tips

Use the same techniques for massaging any of the back of the neck muscles.

Massage can be done standing or sitting up but is better lying down so the muscles can relax.

Remember to relax and breathe while you do the massage.

Take a break periodically to rest your arms and hands. Learn to self-treat the arms and hands so you keep them out of trouble.

Treatment of All Back-of-the-Neck Muscles

First it is important to do a quick vertebral artery test to determine if it is safe to treat the back of the neck. This test helps to determine if this artery is functioning normally; if it is not, you will likely feel sensations of dizziness, vertigo, nausea, feelings of faintness, and/or vision problems while doing the test. To test your own vertebral arteries, first sit down in a chair with arms. While comfortably seated, look up at the ceiling, then turn your head all the way to the right. This is like trying to see something on the ceiling behind you. Hold the position for up to thirty seconds. Stop immediately if you feel any of the symptoms listed above. If you felt no symptoms turning to the right, repeat the test by looking up and then turning your head to the left. Again hold for up to thirty seconds. If you feel any of the indicated

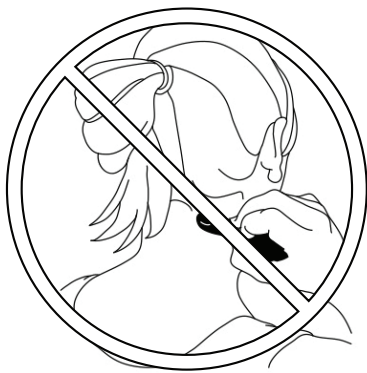


Figure 4.35 Do not use a deeply penetrating tool such as the Shemala Fingers to massage just below the base of the skull. It is possible to rupture the vertebral artery. Please read the text for specific directions.

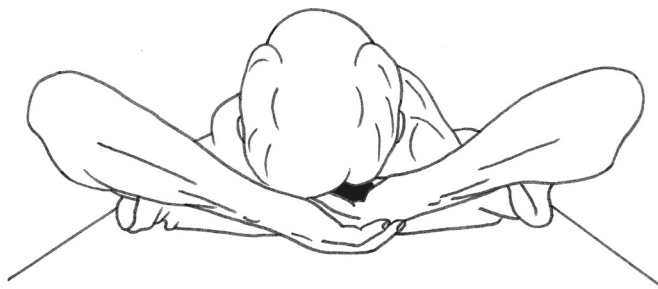


Figure 4.36 Position of hands for posterior neck massage with a ball lying down. Using both hands, stroke toward the center line. Change hands for the other side.

symptoms with either side, do not massage or stretch your neck. See a doctor as soon as possible to check for obstruction of the vertebral artery (Lowe 2009).

You can safely massage the back of the neck and avoid pressing on the vertebral artery by following these instructions. First find the bottom of the back of the skull with your fingers. Tip your head back slightly to feel the midline of the bottom of the skull where the spine attaches to the head. Allow your fingers to explore the back of your neck to find the first bony knob just an inch or less below the skull. This is the spinous process of the second vertebra. Now walk your fingers an inch or two straight out to the side away from the bony knob. Just above here (but below the skull) lies the vertebral artery on both the left and right sides of the neck. It is deep underneath the semispinalis capitis muscle in a small space called the “suboccipital triangle.” You won’t feel a pulse here because it is too deep.

If your head is turned to the opposite side and deep pressure is applied with a specific tool such as a Thera Cane (figure 4.34) or Shemala tool (figure 4.35), it may be possible to damage these delicate arteries and cause a stroke. A simple rule for neck massage is to use a broad tool such as a tennis ball or 60 mm high bounce ball (figure 4.36) to apply pressure across the entire neck an inch below the skull. To massage lower down your neck, you can use either a ball or supported fingers as seen in figures 4.37 and 4.38.



Figure 4.37 First hand in place for massage of opposite side of the posterior neck with supported fingers

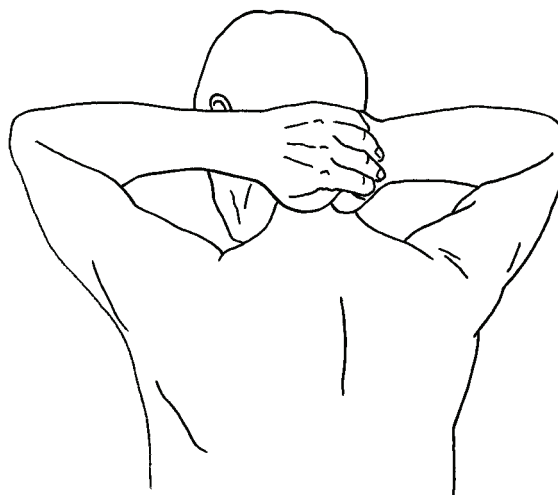


Figure 4.38 Second hand in place for posterior neck massage with supported fingers. Stroke toward the spine; switch hands to work the other side. This technique is also used lying down.

Muscles of the Jaw, Face, and Head

Although there are a great number of muscles in the jaw, face, and head, self-treatment is directed mainly at the two chewing muscles, the temporalis and the masseter. Trigger points in these two muscles, along with those in the trapezius and sternocleidomastoid muscles, account for much of the pain in the jaw, face, and head, including the infamous temporomandibular joint (TMJ). Trigger points in the other muscles of the jaw, face, and head usually exist as satellites to trigger points in these four primary muscles. Symptoms from the smaller muscles may subside spontaneously when the trigger points in the primary muscles are deactivated (Simons, Travell, and Simons 1999).

Trigger points in the jaw muscles have a variety of causes, including gum chewing, tooth decay, abscesses, and grinding the teeth at night. Dental work frequently leaves patients with trigger points in the strained or exhausted jaw muscles. Emotional tension, mouth breathing, and the head-forward posture also cause trigger points in the jaw muscles by promoting habitual tension in them. Trigger points in the sternocleidomastoid and trapezius muscles resulting from whiplash, falls, and other kinds of physical strain tend to promote trigger points in the muscles of the jaw, face, and head (Simons, Travell, and Simons 1999; Hong 1994).

Temporalis

The *temporalis* (tem-por-AL-iss) is a large, flat muscle covering the temple above and in front of the ear (figure 4.39). The attachment of the temporalis to the coronoid process of the lower jawbone allows it to assist the masseter in bringing the jaws together. Like the masseter, the temporalis is a chewing muscle.

Temporalis trigger points contribute to headaches in the front and on the sides of the head. They're also a very common, though usually unsuspected, cause of pain and hypersensitivity in the upper teeth, along with pain and minor inflammation in the upper gums. Your teeth may be bothered more by hot and cold than by pain. Diffuse pain in the upper teeth or jaw when you chew or bite down is apt to be coming from the temporalis muscles. Your teeth may feel like they don't fit together right (Simons, Travell, and Simons 1999).

Trigger points in the masseter and sternocleidomastoid muscles sponsor trigger points in the temporalis and can quickly reactivate them after you've gone to the trouble of subduing them (Simons, Travell, and Simons 1999). Massage the temporalis with supported fingers (figure 4.40). In the illustration, observe that the weight of the head supplies the pressure.

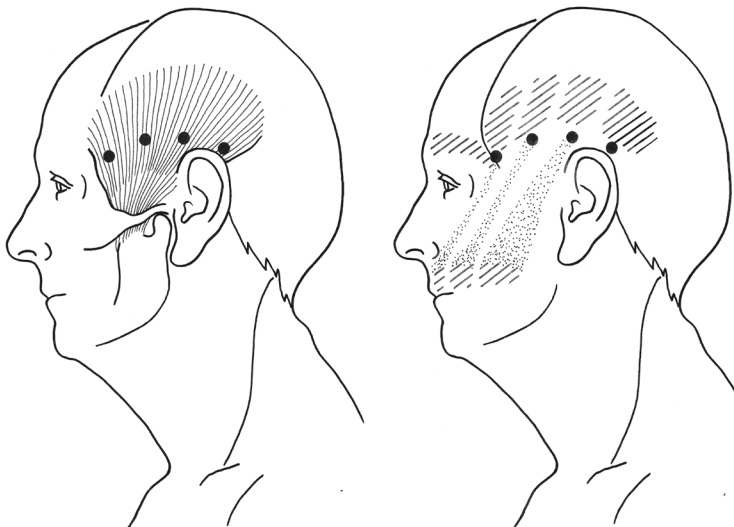


Figure 4.39 Temporalis trigger points and referred pain patterns



Figure 4.40 Temporalis and masseter massage with supported fingers

Masseter

The *masseter* (MASS-uh-ter) muscles are the power muscles of the jaw, exerting the major force in biting and chewing. In the mirror, you can see your masseters contract right in front of your earlobes when you grit your teeth. “Masseter” comes from the Greek word for “to chew.” Pain from masseter trigger points can fool even the experts.

Mary, age twenty-nine, was a dentist who was frustrated in the treatment of some of her patients who complained of tooth pain but had no problems that she could find. She also had pain in her own jaws and in her own perfectly healthy teeth. She suspected the pain was myofascial, but she didn't feel competent to diagnose or treat it. In dental school, they'd been told about trigger points but hadn't spent much time on them. A clue to Mary's own trouble lay in the chronic headaches and neck pain she had suffered since dental school, caused by leaning over all day and twisting to look into mouths. The strain of her work had caused trigger points in her sternocleidomastoid muscles, which in turn were generating secondary trigger points in her masseter muscles. Her headaches were coming from her sternocleidomastoids, and the pain in her jaws and teeth was coming from her masseters.

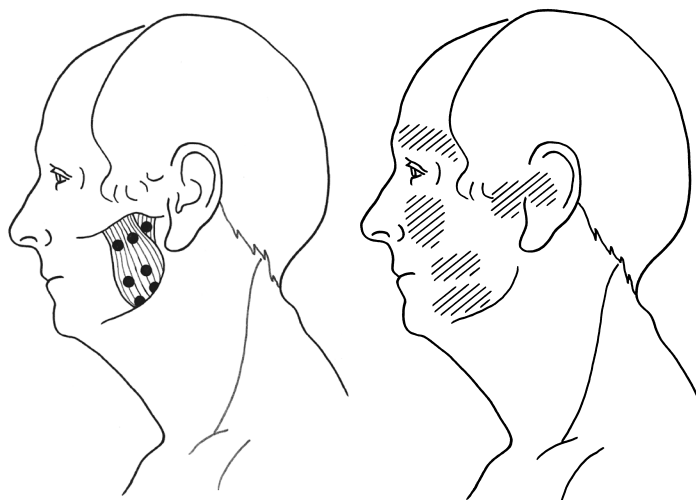


Figure 4.41 Masseter trigger points and referred pain pattern

Trigger points in the masseter muscles cause pain in several places (figure 4.41). The trigger point

Treatment Tips

Massage the inside of the masseter muscle by putting your thumb in your mouth and pinching it against your fingers.

You can keep your teeth together for this technique.

Clinch your teeth together to feel the masseter contract in the mouth. Then relax again to do the massage. You can massage all around the cheek, but make sure you know where the masseter begins and ends.

You will look a bit silly if anyone sees you doing this before you go to the dentist's office, but you'll be glad you did.

in the deep layer right in front of the ear is especially important as a cause of pain in the temporomandibular joint. Masseter trigger points can also increase muscle tension to such an extent that it restricts opening of the jaw. This jaw tightness encourages tightness in the vocal mechanism. Singers have reported hitting their high notes with greater ease after they've worked on their masseters and other jaw muscles (Simons, Travell, and Simons 1999). People who use their voices in their work will benefit from massaging the jaw, mouth, and throat muscles.

Masseter trigger points cause pain in both upper and lower teeth. They are also a common source of tooth hypersensitivity to heat, cold, and touch. Misinterpretation of these symptoms can result in unnecessary dental work, including needless tooth extractions (Simons, Travell, and Simons 1999).

Trigger points in the masseter muscles also cause pain in the front of the face, under the eyes, and over the eyebrows, symptoms that are often mistaken for sinusitis. They can even cause sinus drainage. When sinus medicine doesn't help your sinus pain, masseter trigger points may be the problem (Simons, Travell, and Simons 1999).

Bags under the eyes can be caused by trigger points in masseter muscles. They can also cause pain deep in the ear, accompanied by a sense of stuffiness or the sound of low roaring. They're often responsible for that maddening itch inside your ear that you can't quite seem to reach (Simons,



Figure 4.42 Masseter massage with thumb and fingers (thumb inside the mouth)

Travell, and Simons 1999). The trigger point just in front of the earlobe may be the one that is responsible for this itch. Trigger points can be found at any place in the masseter, from the cheekbone to the bottom edge of the jaw.

Massaging the masseter from outside the mouth with supported fingers is good therapy. To work the masseter most effectively, however, it's necessary to put your thumb inside your mouth and knead the muscle between thumb and fingers (figure 4.42). The masseter feels very firm, thick, and rubbery. If you're working the right place, you'll feel the tip of your thumb touching the coronoid process, the sharp-edged, fin-shaped piece of bone rising from near the back of the jawbone. Seek out each exquisitely tender knot, from the cheekbone to the bottom of the jaw. Work on them every day until squeezing the muscle no longer hurts. Working these muscles too aggressively can leave you sore, so follow the treatment guidelines in chapter 3 and go easy at first.

You can go a long way toward preventing trouble with the jaw muscles by giving up chewing gum. In addition, avoid biting your nails, don't chew on ice, and don't open things with your teeth. Find out what you can do to stop grinding your teeth in your sleep. Train yourself not to clench your jaws when you're tense and under pressure. See chapter 12 to

learn more about reducing habitual muscle tension.

Pterygoid Muscles

The *pterygoid* (TEHR-uh-goyd) muscles are well hidden by the lower jawbone, which is very inconvenient, since their trigger points are a frequent cause of pain in temporomandibular joints of the jaw. The word "pterygoid" comes from the Greek for "wing-like," a reflection of their shape. The root word is similar to that of "pterodactyl," the name of the winged dinosaur.

The *medial pterygoid* muscle causes pain in the temporomandibular joint and the ear, which increases when you bite down on something (figure 4.43). It can also refer pain to the back of the mouth, hard palate, and tongue, and can make it hurt to swallow. Medial pterygoid trigger points make it difficult to open the mouth wide. A sense of stuffiness in the ear can come from a tight medial pterygoid when it prevents the eustachian tube (in the middle ear) from opening. This may occur because of referred effects on the tensor veli palatini and salpingopharyngeus muscles in the back of the throat, which have more direct control over the eustachian tube. The medial pterygoid muscle helps close the jaw by attaching to the maxilla (upper jaw) outside and inside of the mouth (not shown). Its problems are therefore strongly associated with those in the masseter (Simons, Travell, and Simons 1999; Bell 1969).

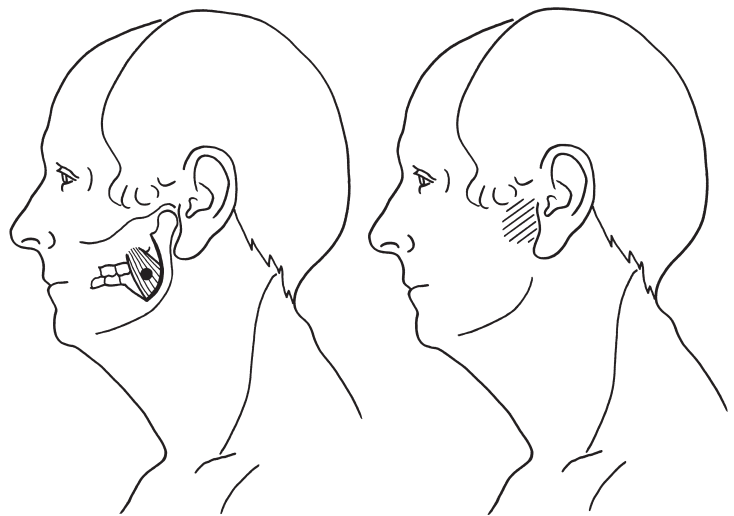


Figure 4.43 Medial pterygoid trigger point and referred pain pattern. (Note that the jawbone is cut away to reveal this muscle deep to the bone.)

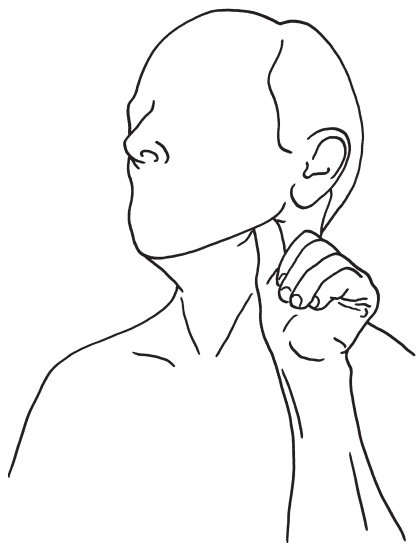


Figure 4.44 Medial pterygoid massage with thumb (avoid pressing into the neck here)

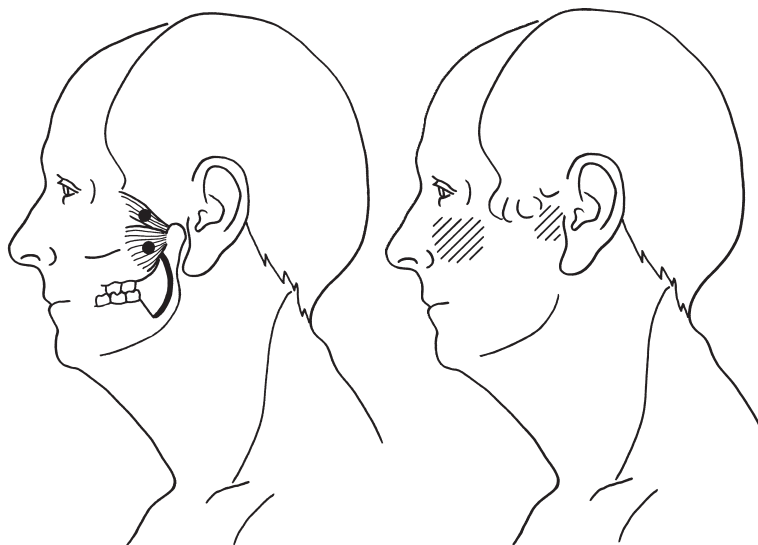


Figure 4.45 Lateral pterygoid trigger points and referred pain pattern

You can massage the medial pterygoid by pressing up with your thumb inside the inner edge of the back of your lower jaw (figure 4.44). Find the corner of your jaw by looking in the mirror. Place your thumb just an inch in front of this bony landmark and press up and out into the inside of the jawbone. Avoid pressing into the neck and onto the carotid artery here. Clench your jaw together to feel the medial pterygoid contract on the lower jaw. This can be an exceedingly painful spot. As with the masseter, massage of the pterygoids can leave you sore, so go easy at first.

The other pterygoid muscle, the *lateral pterygoid*, is the number one myofascial source of pain and temporomandibular joint (TMJ) dysfunction (figure 4.45). Constant trigger point–generated tension in the lateral pterygoids tends to pull the lower jaw forward and disarticulate, or partially dislocate, the joint. Popping or clicking in the jaw is the result of this and displacement of the *meniscus*, which is the articular disc that separates the jaw bone from the skull and allows for movement in the joint. As with the masseter, trigger points in the lateral pterygoid refer pain to the cheek, mimicking sinus pain. They can also stimulate sinus secretions. Many “sinus attacks” are simply the effects of lateral pterygoid trigger points (Simons, Travell, and Simons 1999; Reynolds 1981; Marbach 1972).

The function of the lateral pterygoid muscles is to help the digastric muscles open the jaw as well as project the lower jaw forward. When only one side of the lateral pterygoid contracts, it causes a lateral, or sideways, deviation of the jaw to the opposite side. *Malocclusion*, or mismatching bite of the top and bottom teeth, can occur with trigger points in these muscles. Trigger points are created in the lateral pterygoids when you have trouble breathing through your nose and must keep your mouth open in order to breathe. Satellite trigger points set up in the front of the face by the lateral pterygoids may account for much of the face pain that comes with allergies. Major dental work that stresses jaw muscles by requiring you to hold your mouth open for long periods of time can be the unsuspected cause of long-term chronic pain in the face and jaws. Trigger points in masseter and temporalis muscles can cause trigger points to develop in the lateral pterygoids by making them work harder to open the mouth (Simons, Travell, and Simons 1999).

Travell and Simons link tinnitus (ringing in the ears) to trigger points in the sternocleidomastoid, masseter, and lateral pterygoid muscles. They quote studies showing that trigger point injection with procaine can completely relieve the condition. The key muscle may be the lateral pterygoid, which is very well hidden by the jawbone. Massage to the muscle is not difficult, though.

Massage the lateral pterygoid with the index finger of the same side hand inside the mouth (figure 4.46). The fingertip should seek the deep pocket above the gums, back beyond

If you need more help relieving mouth, jaw, or headache pain, look for *The Myofree Solution: The Missing Piece in the TMJ Puzzle* in the Resources section.

your upper molars—the place you have to dig peanut butter out of. This “peanut butter pocket” is about the size of the tip of your index finger. Push back as far as you can, and then press both upward and forward toward your nose using tiny, short strokes. The pressure is aimed toward the crown of your head. If trigger points are present, this can be excruciatingly painful. Go easy. Rome wasn’t built in a day. It will take you a while to deactivate these little points. You won’t be able to do this massage unless your fingernail is very short.

After massaging the masseter and temporalis muscles, you

can use another approach to treat the lateral pterygoids. First, look in the mirror to find the opening of your ear. Place your finger on your face just in front of the ear canal. Open your jaw to feel the condyle of the jaw (the top round projection of the jawbone that interacts with the skull) move forward to create a hollow just in front of the ear. This is not the location of the trigger point; keep reading. Move one inch forward toward the nose to find a second very shallow hollow. Deep in here lies the lateral pterygoid. Once you find the spot, prop your mouth open about two to three fingers’ width wide with the bottom of a paper or Styrofoam cup or with an apple (figure 4.47). This will relax the masseter and allow deep massage of the lateral pterygoid. Use your index finger to press slightly up toward the top of the head and forward toward your nose. The stroke really resembles a half-circle and is very tiny. You might use a massage tool such as the Shemala Fingers or a pencil eraser for deep pressure. You will look ridiculous, but you will feel better. When the trigger points on both sides of the jaw are significantly less painful, stretch the lateral pterygoid by pushing the jaw (press below the lower front teeth) back toward the ears. The mouth should be relaxed and the teeth slightly apart.



Figure 4.46 Lateral pterygoid massage with index finger in mouth



Figure 4.47 Massaging lateral pterygoid from the outside with the mouth propped open

Digastric and Mylohyoid Muscles

Trigger points in the *digastric* (dahy-GAS-trik) muscle are under the chin behind and below the corner of the jaw, immediately in front of the top of the sternocleidomastoid. The word “digastric” comes from the Greek words meaning “two bellies.” The posterior digastric trigger point, lying just behind the corner of the jaw, refers pain to the top end of the sternocleidomastoid muscle and the mastoid bone (figure 4.48). The anterior trigger point, which is under the chin, sends pain and hypersensitivity to the

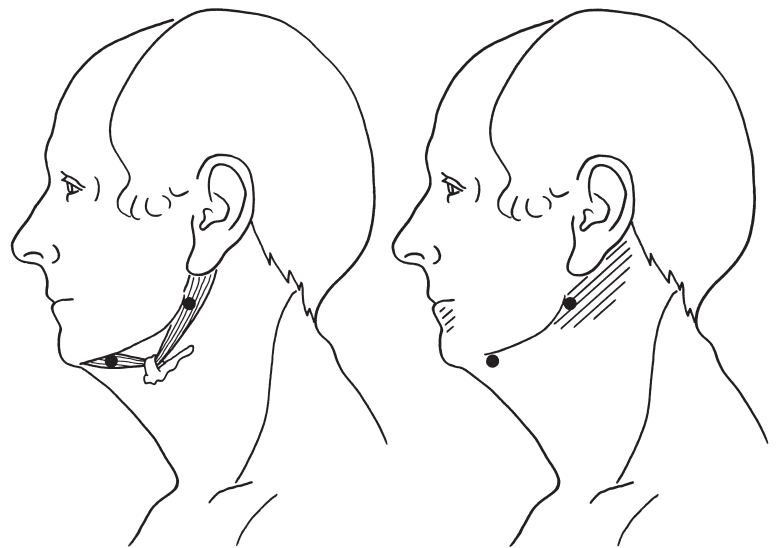


Figure 4.48 Digastric trigger points and referred pain pattern. Pain shown below the lower lip is actually felt in the lower teeth.

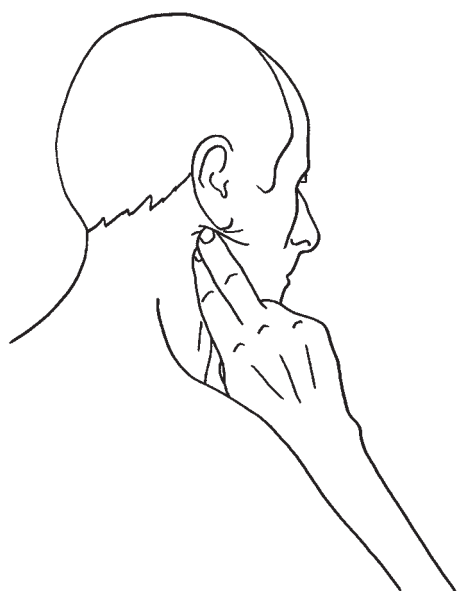


Figure 4.49 Gentle posterior digastric massage with fingertips

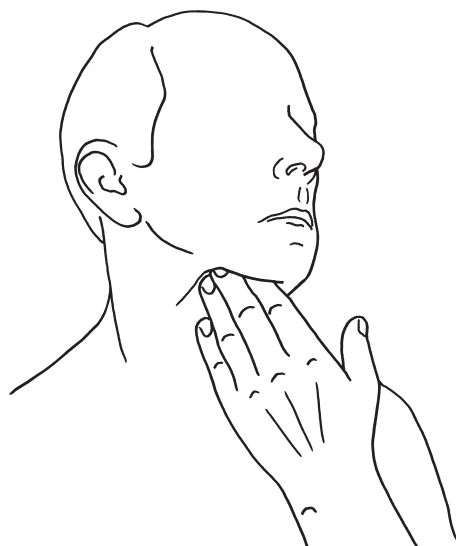


Figure 4.50 Anterior digastric massage with fingertips (use same side hand or thumb and avoid the pulse)

lower front teeth. The *mylohyoid* (mahy-loh-HAHY-oid) muscles, also under the chin, refer pain to the tongue (not shown). Digastric and mylohyoid trigger points are also one of the many causes of pain when you swallow. Trigger point tenderness under the chin is often mistaken for swollen lymph nodes (Simons, Travell, and Simons 1999). There are lymph nodes throughout this area of the neck. Read the section “Contraindications: Reasons to Be Cautious” in chapter 3 for more information on lymph nodes. Since the function of the digastric muscles is to open the mouth, habitual mouth breathing promotes the development of trigger points in them. The problems of allergy

sufferers are frequently made worse by the effects of trigger points in the digastric and lateral pterygoid muscles. These muscles have to stay contracted to keep your mouth open when you have difficulty breathing through your nose (Simons, Travell, and Simons 1999).

Dental care can create trigger points in the digastric and lateral pterygoid muscles, as you hold the mouth open for long periods of time. Excess tension in these muscles can cause the masseter and temporalis muscles to work extra hard just to close the jaw. The jaw sometimes juts forward as a result of trigger points in these muscles, resulting in a malocclusion, or a mismatched bite. Massage the posterior digastric muscle between the corner of the jaw and the ear (figure 4.49). Be gentle: there is a tiny, vulnerable bone called the styloid process just behind it. For the anterior digastric, curl the fingers or thumb of the same side hand up and under the jaw and press toward the bone about an inch back from the chin (figure 4.50). Avoid the pulse of the carotid arteries near here on the neck. Use the fingertips in the soft area under the chin to massage the mylohyoid muscles. Massaging the muscles under the chin can help free up a tight voice and make it more resonant.

Buccinator

The *buccinator* (BUCK-sih-nay-tur) is a cheek muscle and is located between the masseter and the mouth. The buccinator draws the corners of the mouth back for facial expressions. It also helps move food around in the mouth and tightens the cheeks for blowing.

Buccinator trigger points cause pain in the upper gum that can be misinterpreted as evidence of tooth decay or an abscess (figure 4.51). They

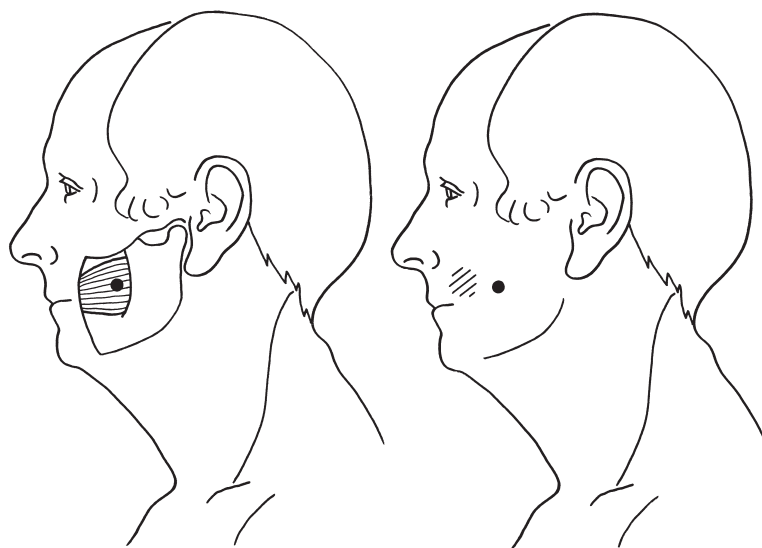


Figure 4.51 Buccinator trigger point and referred pain pattern

also cause diffuse pain on chewing and swallowing (Simons, Travell, and Simons 1999; Curl 1989). Massage the buccinator between the fingers and thumb, with the thumb inside the mouth, the same way you massage the masseter muscles (figure 4.42).

Orbicularis Oculi

The *orbicularis oculi* (or-bic-yu-LAIR-iss AHK-you-lye) surrounds the eye and is responsible for closing the eye and for squinting. The word “oculi” refers to the eye. “Orbicularis” (as in orb or orbit) refers to the circle the muscle makes around it.

Nervous tension, eyestrain, bright light, and poor eyesight can keep this muscle constantly contracted and set up trigger points.

Orbicularis oculi trigger points cause pain immediately above the eye and to the bridge and side of the nose (figure 4.52). They also cause the print to jump around on the page when you try to read. They can also be responsible for twitching of the eye or drooping of the upper eyelid. Sternocleidomastoid trigger points may be at the heart of these problems, because of their referred influence on the orbicularis oculi. To treat the orbicularis muscles, massage around the eyes carefully with the fingertips. It may do more good, however, to massage the sternocleidomastoids (Simons, Travell, and Simons 1999).

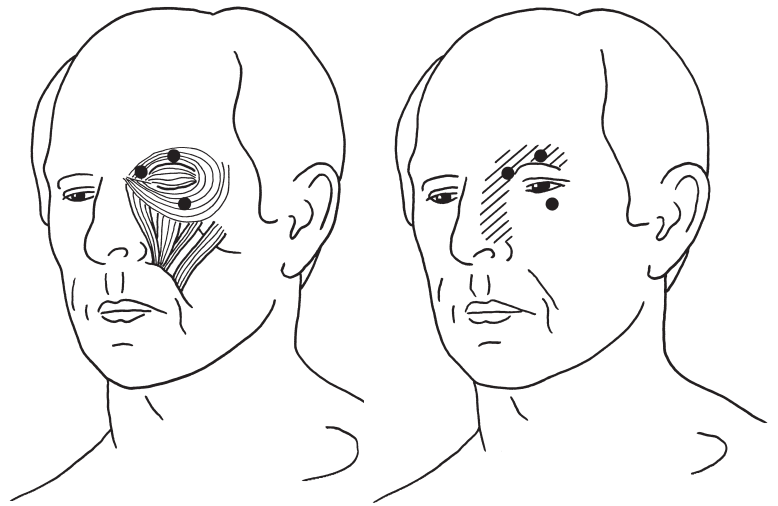


Figure 4.52 Orbicularis oculi trigger points and referred pain pattern

Zygomaticus and Levator Labii Muscles

The *zygomaticus* (zi-go-MAT-uh-cus) and *levator labii* (luh-VAY-ter LAY-bee-eye) are cheek muscles that lie between the buccinator and the nose. They attach to the cheekbone and the rim of the eye socket. These small muscles function primarily as muscles of facial expression, functioning to pull the upper lip up and back.

Trigger points in zygomaticus and levator labii muscles cause pain in the face below the eye, along the side of the nose, and over the bridge of the nose as far as the middle of the forehead (figure 4.53). They can cause allergy symptoms such as runny nose, sneezing, and itchy eyes, and may contribute a significant part of your sinus pain or tension headaches

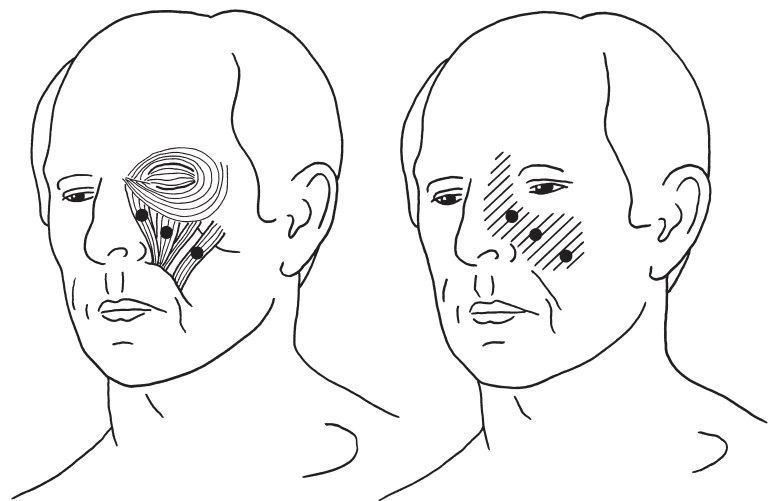


Figure 4.53 Zygomaticus and levator labii trigger points and referred pain pattern

(Simons, Travell, and Simons 1999). Massage the entire area below the eye, down to the upper lip, with the tips of the fingers, using short, deep strokes (figure 4.54). Knead the area just below your cheekbone between your fingers and thumb (figure 4.55).

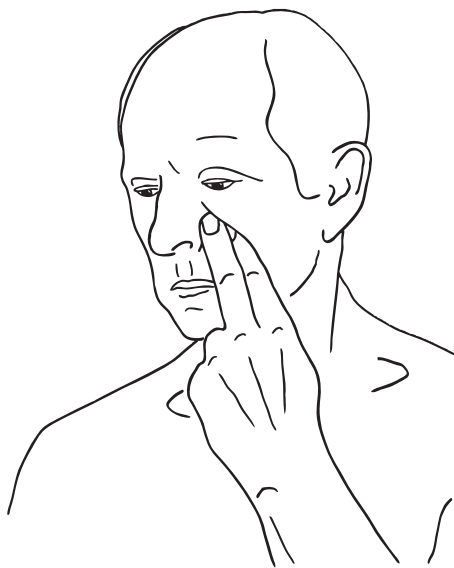


Figure 4.54 Zygomaticus and levator labii massage with fingertips



Figure 4.55 Kneading the zygomaticus between fingers and thumb

Throat Muscles

The *platysma* (pluh-TIZ-muh) is a very thin sheet of muscle lying right under the skin and covering the entire throat area, from the chin to the collarbones (not illustrated). The word “platysma” is derived from two Greek words meaning “broad muscle.” Platysma trigger points can cause a prickling sensation over the lower part of the cheeks as well as over the chin, throat, and upper chest (not shown). Trigger points in the scalenes and sternocleidomastoid muscles activate platysma trigger points. They may also arise from habitual overuse of the platysma in certain emphatic facial expressions (Simon, Travell, and Simons 1999). Massage all of the throat area with kneading strokes of the fingers and thumb.

The *longus colli* (LON-gus COH-lye) muscles lie alongside the windpipe on either side, attaching to the front side of the neck vertebrae. Their trigger points are thought to cause sore throat and to make it hurt to talk or sing (Simons, Travell, and Simons 1999). The carotid artery overlies the longus colli. It is best to have a specially trained therapist treat this vulnerable area of the neck. Trigger points in these and all muscles of the front of the neck can be created in whiplash-type accidents. Many certified neuromuscular therapists learn a detailed technique for treating this area. You may be able to find a therapist in your area at www.IAHE.com.

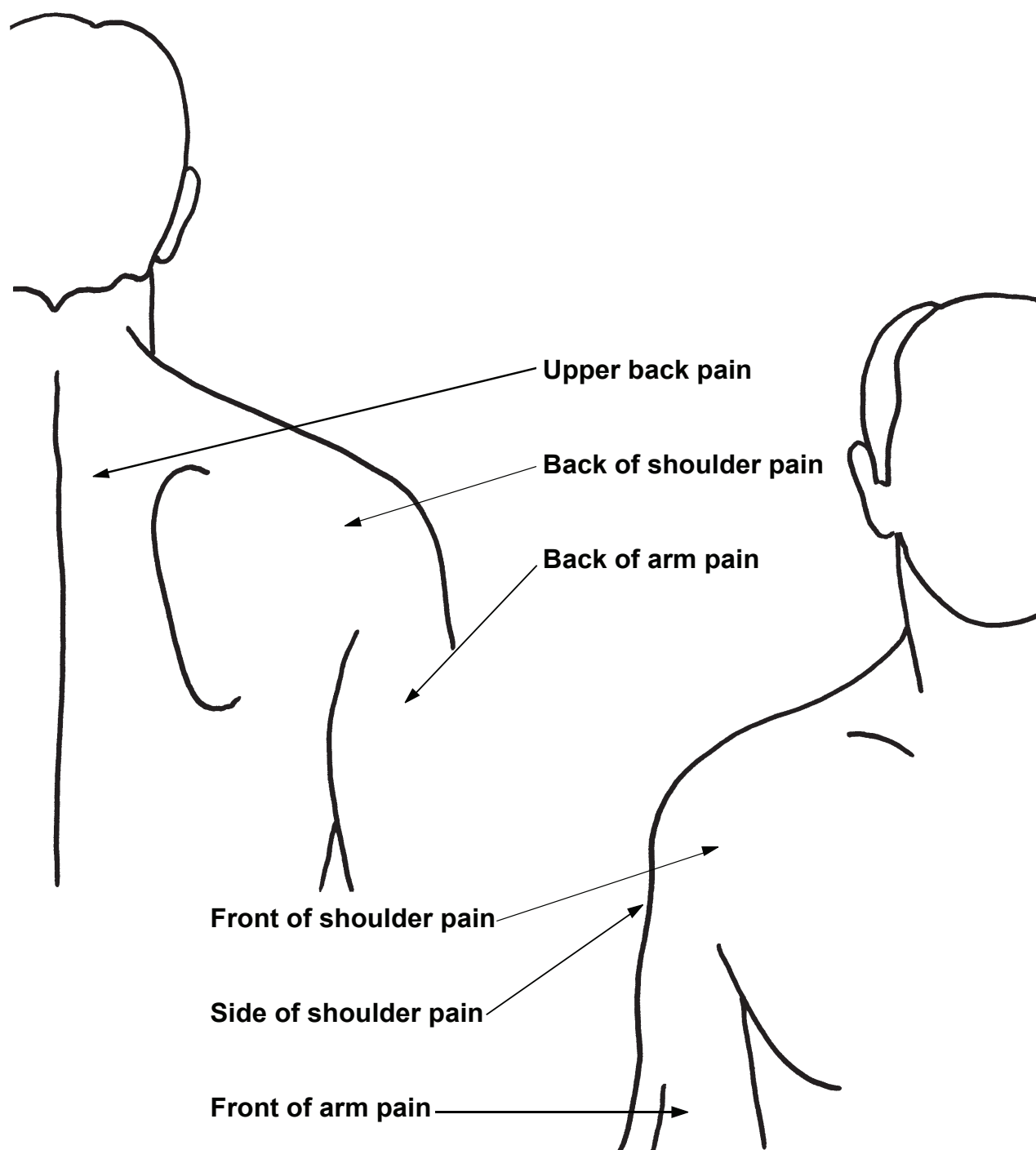
Scalp Muscles

A large, thin muscle with two bellies covers the front, top, and back of the head. The front half of this muscle is called the *frontalis* (frun-TAL-iss). The back half is called the *occipitalis* (ahk-sih-pih-TAL-iss). Trigger points in the frontalis refer pain to the forehead (not shown). Trigger points in the occipitalis refer pain to the side and back of the head and through the head to the eye (not shown) (Simons, Travell, and Simons 1999).

The occipitalis is the muscle that lets you wiggle your ears. It also establishes a base for contraction of the frontalis, which raises the eyebrows and wrinkles the forehead. Anxiety and excitement overwork these muscles. You can exhaust them by habitually contracting your face and forehead in an expression of rapt attention. Massage the frontalis and occipitalis muscles with your fingertips (not shown).

Chapter 5

Shoulder, Upper Back, and Upper Arm Pain



Pain Guide

Shoulder, Upper Back, and Upper Arm

Boldface type indicates a primary pain pattern. Regular type refers to a less common or satellite trigger point pattern. Muscles are listed in the order of how likely they are to be the problem. *Also see Other Symptoms Guide.* We've made these guides available for download at www.newharbinger.com/24946. See the back of the book for more information.

Back of Arm

scalenes (94)
triceps (121)
posterior deltoid (115)
subscapularis (113)
supraspinatus (108)
teres major (117)
teres minor (112)
latissimus dorsi (117)
serratus posterior superior (105)
coracobrachialis (118)

Back of Shoulder

posterior deltoid (115)
levator scapula (72)
scalenes (94)
supraspinatus (108)
teres major (117)
teres minor (112)
subscapularis (113)
serratus posterior superior (105)
latissimus dorsi (117)
triceps (121)
trapezius (66)
superficial spinal muscles (195)

Front of Arm

scalenes (94)
infraspinatus (94)
biceps (120)
brachialis (130)
triceps (121)
supraspinatus (108)
anterior deltoid (115)
subclavius (166)

Front of Shoulder

infraspinatus (94)
anterior deltoid (115)
scalenes (94)
supraspinatus (108)
pectoralis major (163)
pectoralis minor (167)
biceps (120)
coracobrachialis (118)
latissimus dorsi (117)
subclavius (166)

Side of Shoulder

infraspinatus (94)
scalenes (94)
middle deltoid (115)
supraspinatus (108)

Upper Back

scalenes (94)
levator scapula (72)
trapezius (66)
rhomboids (104)
latissimus dorsi (117)
deep spinal muscles (192)
superficial spinal muscles (195)
serratus posterior superior (105)
infraspinatus (94)
serratus anterior (169)
splenius cervicis (75)
supraspinatus (108)
multifidi and rotatores (78)

Other Symptoms Guide

Shoulder, Upper Back, and Upper Arm

Bursitis

scalenes (94)
supraspinatus (108)
teres major (117)
subscapularis (113)
deltoids (115)
biceps (120)
latissimus dorsi (117)
pectoralis major (163)

Crepitus (sounds with movement)

Back

rhomboids (104)

Shoulder

supraspinatus (108)
biceps (120)

Frozen Shoulder (adhesive capsulitis)

subscapularis (113)
infraspinatus (94)
supraspinatus (108)
pectoralis major (163)
serratus anterior (169)
latissimus dorsi (117)
rhomboids (104)
deltoids (115)

Impingement Syndromes

supraspinatus (108)
anterior deltoid (115)
subscapularis (113)
biceps (120)

Musculocutaneous Nerve Entrapment

coracobrachialis (118)

Pain or Stiffness with Movement

Breathing

serratus posterior superior (105)
serratus anterior (169)
scalenes (94)
pectoralis minor (167)
latissimus dorsi (117)

Driving without Power

Steering

teres major (117)

Raising Arm Out to the Side

supraspinatus (108)
subscapularis (113)
deltoids (115)

Reaching Back at Shoulder Level

rhomboids (104)
pectoralis minor (167)

Reaching Behind

supraspinatus (108)
infraspinatus (94)
pectoralis minor (167)
coracobrachialis (118)

Reaching Down

rhomboids (104)

Reaching Up and Back

teres major (117)

Reaching Up and Forward

latissimus dorsi (117)
teres major (117)
supraspinatus (108)
pectoralis minor (167)

Resting Elbow on a Desk

teres major (117)

Sleeping: Side Lying

infraspinatus (94)
latissimus dorsi (117)

Turning Arm Palm Up

subscapularis (113)

Reduced Range of Motion

Abduction (movement toward the outside)

deltoids (115)
subscapularis (113)
pectoralis major (163)
pectoralis minor (167)
teres major (117)
triceps (121)
supraspinatus (108)

Adduction (movement toward the body)

infraspinatus (94)
supraspinatus (108)

Extension of Upper Arm

deltoids (115)
infraspinatus (94)
pectoralis minor (167)
supraspinatus (108)
biceps (120)

External (lateral) Rotation

subscapularis (113)
infraspinatus (94)
pectoralis major (163)
pectoralis minor (167)

Flexion of Upper Arm

deltoids (115)
pectoralis minor (167)
supraspinatus (108)
infraspinatus (94)
biceps (120)
teres major (117)
latissimus dorsi (117)
pectoralis minor (167)

Internal (medial) rotation

infraspinatus (94)
teres minor (112)
subscapularis (113)

Upward Rotation (movement of arm from 90 degrees abduction to completely overhead)

- supraspinatus (108)
- deltoids (115)
- subscapularis (113)
- serratus anterior (169)
- coracobrachialis (118)
- biceps (120)

Restlessness

- scalenes (94)

Tenderness (shoulder)

- infraspinatus (94)
- subscapularis (113)
- biceps (120)

Tendonitis or Arthritis

- supraspinatus (108)
- subscapularis (113)
- deltoids (115)
- biceps (120)
- infraspinatus (94)
- teres major (117)
- pectoralis major (163)

Thoracic Outlet Syndrome

- scalenes (94)
- pectoralis minor (167)
- subclavius (166)

Pseudo–Thoracic Outlet Syndrome

- pectoralis major (163)
- latissimus dorsi (117)
- subscapularis (113)
- teres major (117)

Weakness

Shoulder

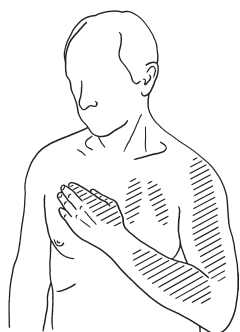
- deltoids (115)
- infraspinatus (94)

Arm

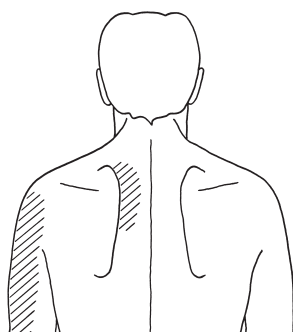
- biceps (120)
- scalenes (94)

Pain Illustrations Guide

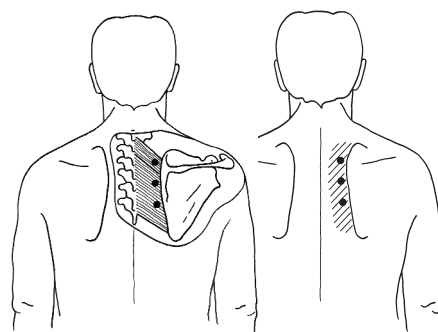
Shoulder, Upper Back, and Upper Arm



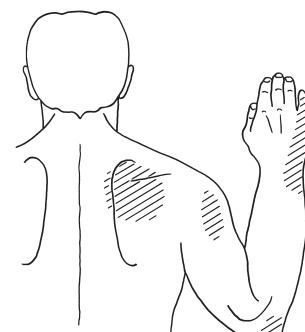
Scalene referred pain pattern, front view (p. 97)



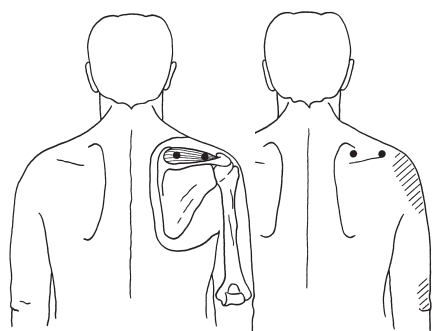
Scalene referred pain pattern, back view (p. 97)



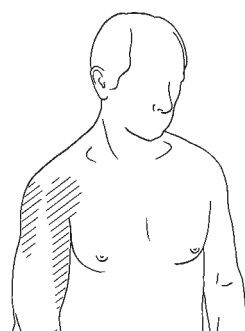
Rhomboid trigger points and referred pain pattern (p. 104)



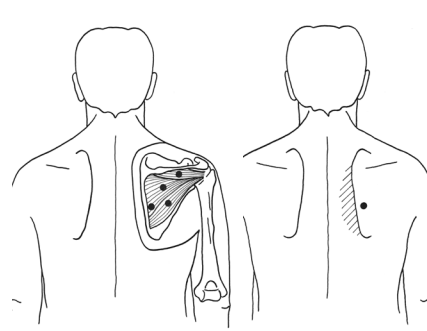
Serratus posterior superior referred pain pattern (p. 106)



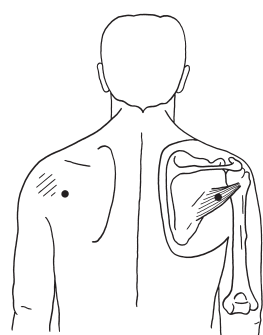
Supraspinatus trigger points and referred pain pattern (p. 108)



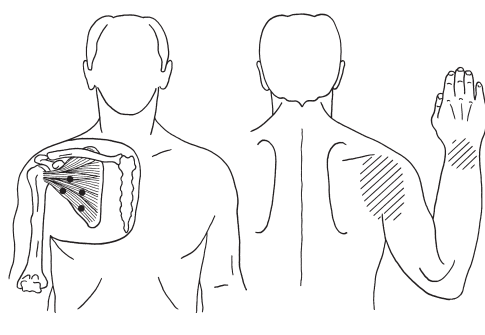
Infraspinatus referred pain pattern (p. 110)



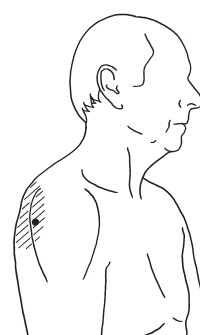
Infraspinatus medial border trigger point with referred pain pattern (p. 110)



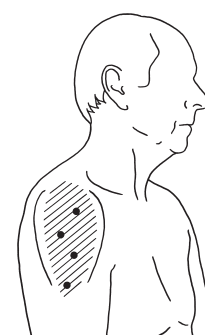
Teres minor trigger point and referred pain pattern (p. 112)



Subscapularis trigger points and referred pain pattern (p. 113)

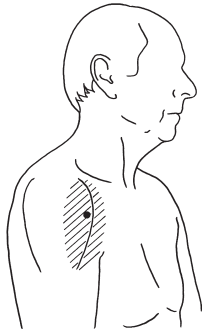


Posterior deltoid pain pattern (p. 116)

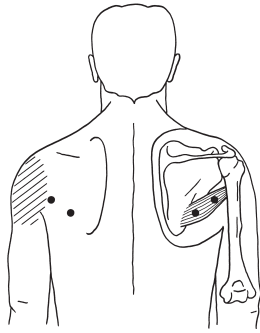


Middle deltoid pain pattern (p. 116)

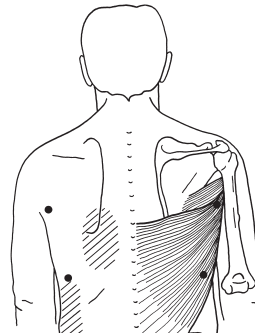
We've made this guide available for download at www.newharbinger.com/24946. See back of book for more details.
Caution: Please read the full treatment instructions for each muscle before beginning.



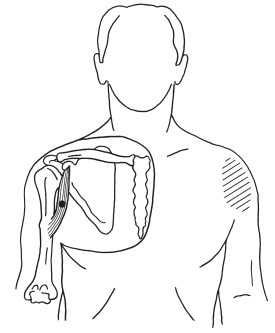
Anterior deltoid pain pattern (p. 116)



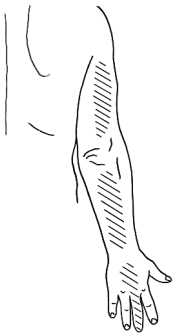
Teres major trigger points and referred pain pattern (p. 117)



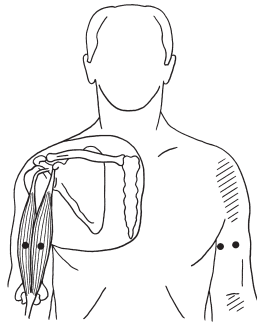
Latissimus dorsi trigger points and referred pain pattern (p. 117)



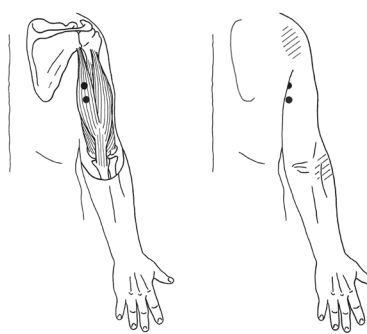
Coracobrachialis trigger points and anterior referred pain pattern (p. 119)



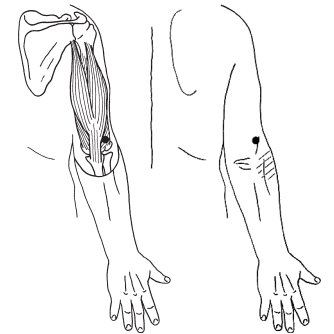
Coracobrachialis posterior referred pain pattern (p. 119)



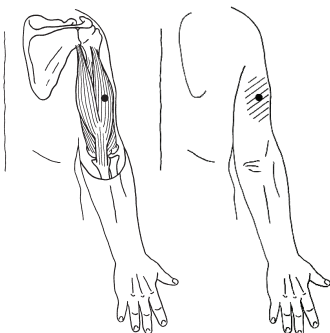
Biceps trigger points and referred pain pattern (p. 120)



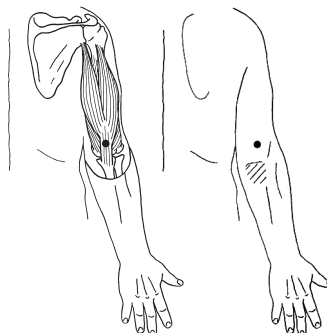
Triceps number 1 trigger points and referred pain pattern (p. 121)



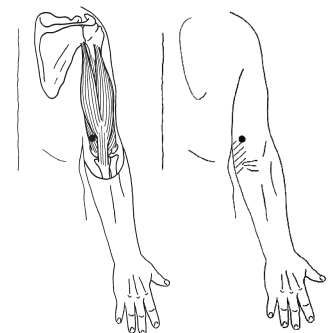
Triceps number 2 trigger points and referred pain pattern (p. 121)



Triceps number 3 trigger points and referred pain pattern (p. 121)



Triceps number 4 trigger points and referred pain pattern (p. 122)



Triceps number 5 trigger points and referred pain pattern (p. 122)

Shoulder, Upper Back, and Upper Arm Pain

Muscles whose trigger points cause shoulder, upper arm, and upper back pain can be divided into five groups: scalenes, shoulder blade suspension muscles, rotator cuff muscles, upper arm muscles, and spinal muscles.

Although the scalenes are neck muscles, their trigger points cause a surprising amount of pain in the upper back, shoulder, and upper arm. Scalene trigger points also contribute significantly to pain and other symptoms in the forearm and hand. The scalenes are so important that they should always come first in troubleshooting pain in all these areas.

The shoulder blade suspension muscles are the rhomboids, levator scapulae, and trapezius. They suspend the shoulder blade from the spinal column, and their function is to help move the shoulder blade into position for all actions of the arm and hand. Their trigger points send pain mainly to the upper back and neck, referring only a minor amount to the shoulder. The trapezius and levator scapulae are discussed in chapter 4.

The four rotator cuff muscles are the supraspinatus, infraspinatus, teres minor, and subscapularis. They attach the shoulder blade to the top of the humerus, the upper arm bone. They rotate the arm and keep the shoulder joint together. Trigger points in the rotator cuff muscles cause a major portion of the pain in the shoulder, along with clicks and grinding noises and loss of mobility. They're indirectly responsible for physical deterioration of the shoulder joint and can predispose it to serious physical injury, including rotator cuff tears and dislocation (Simons, Travell, and Simons 1999).

Muscles that move the upper arm include the deltoids, teres major, latissimus dorsi, coracobrachialis, biceps, and triceps. Only the last three are actually part of the arm. In addition to pain in the shoulder, back, and upper arm, trigger points in these muscles can send pain and other symptoms to the forearm, hand, and fingers.

The spinal muscles interconnect the vertebrae and have no direct connection to the shoulder. While they're a common source of upper back pain, they're discussed in chapter 8 along with similar muscles of the mid- and low back.

Scalenes

The *scalenes* (SKAY-leenz) are a group of three, sometimes four, small muscles in each side of the neck. The word “scalene” comes from a Greek word meaning “uneven.” The scalene muscles are all of different lengths, like the sides of a scalene triangle. In addition, each scalene muscle divides to attach to several vertebrae, resulting in sets of muscle fibers of varying lengths. The scalenes can have many trigger points in many different locations. The following case histories are a sampling of the broad diversity of problems that can originate in the scalene muscles. In each case, self-applied trigger point massage solved the problem.

Betsy, age thirty-two, worked for the post office until someone rear-ended the vehicle she was driving. It was only a minor accident, but it left her with periodic disabling spasms in the right side of her neck. Almost any little strain would set it off. When she had a flare-up, she typically needed several days to recover. In the meantime, she was unable to work.

Hong Sun, age thirty-one, a ballet dancer, complained of a constant ache in his upper back at the inner edge of his left shoulder blade. It felt good to reach over his shoulder and massage the place with his fingers, but it didn't stop the pain. He had had the pain for several years.

Amy, age seventeen, had been a serious student of the cello, but she quit playing because of weakness and numbness in her shoulders, arms, and hands. Her parents believed the problem might be related to an accident in the swimming pool that had strained her neck. Thousands of dollars' worth of medical tests had turned up nothing.

Connie, forty-nine, a potter, experienced pain in her shoulder and all down her right arm. It was always worse in the morning and often awakened her in the night. Her forearm and hand were vaguely numb most of the time, and the hand often felt swollen. She was concerned that she wasn't going to be able to continue her work and support herself if the trouble got any worse.

Symptoms

Trigger points in the scalenes cause an impressively wide distribution of pain, numbness, and other abnormal sensations in the chest, upper back, shoulder, arm, and hand (figures 5.1, 5.2, and 5.3). Pain may occasionally occur in the back of the neck (not shown). Any of the trigger points in the scalene muscles can cause symptoms in any part of the referral areas, though certain trigger points may favor certain areas. Trigger points low in the middle and posterior scalenes, for instance, are more often the ones that cause chest pain. Trigger points high in the anterior scalene and in the entire middle scalene are often the cause of pain in the shoulder, upper arm, forearm, thumb, and first finger. There is a fourth scalene that is only sometimes present. It creates pain in the upper arm, back of the forearm, wrist, hand, and all five fingers, especially in the thumb (Simons, Travell, and Simons 1999).

The scalenes are rarely suspected as the source of the trouble because they're almost entirely hidden by the sternocleidomastoid muscles (figure 5.4). Pain is hardly ever felt in the scalenes themselves, but scalene trigger points can be the primary source of pain in their referral areas. Unsuspected scalene trigger points are often the critical element in the failure of conventional therapies. Satellite trigger points are likely to be created in scalene referral areas, which make scalene trigger points quite frequently the ultimate source of pain in the chest, upper back, shoulder, arm, and hand (Simons, Travell, and Simons 1999; Lindgren, Manninen, and Rytönen 1996).

Symptoms created by the scalenes are easily misdiagnosed. Upper back pain evoked by scalene trigger points is almost always wrongly blamed on the rhomboid muscles. Restlessness in the neck and shoulder, a classic sign of scalene trigger points, is written off as a nervous tic. Pain referred from the scalenes to the chest is mistaken for

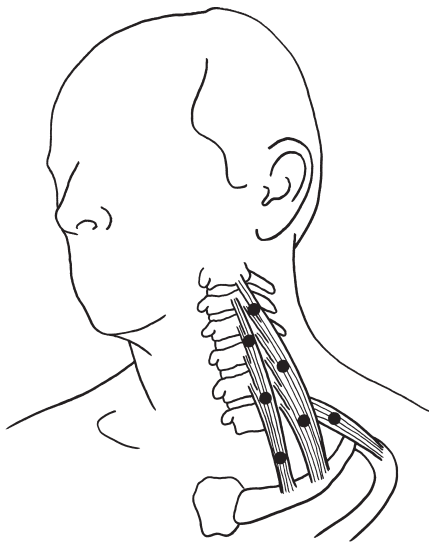


Figure 5.1 Scalene trigger points

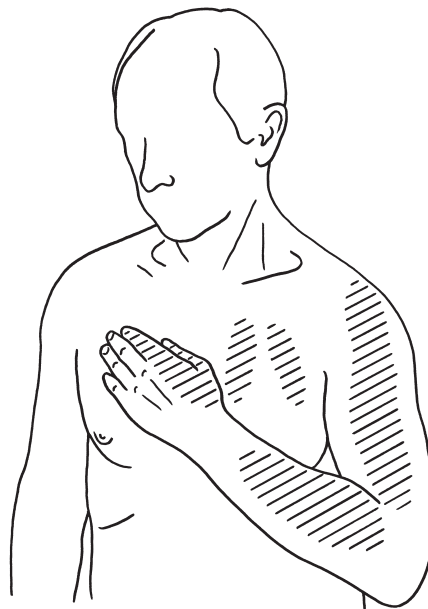


Figure 5.2 Scalene referred pain pattern, front view

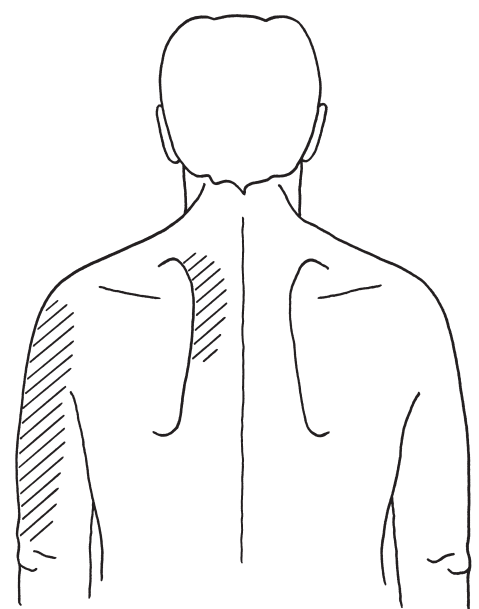


Figure 5.3 Scalene referred pain pattern, back view

angina. Pain sent to the shoulder by the scalenes is often mislabeled bursitis or tendinitis. Scalene-referred pain down the front and back of the upper arm is mistakenly treated as muscle strain. The pattern of scalene referral in the shoulder, arm, and hand may make a neurologist infer that a degenerated vertebra or collapsed disk is causing compression of a cervical nerve root (Simons, Travell, and Simons 1999; Long 1956). The scalenes will also reduce your ability to tilt your head to the side.

When trigger points shorten the scalene muscles, they tend to keep the first rib pulled up against the collarbone. The collarbone squeezes the blood vessels and nerves that pass through the area on their way to the arm; this is termed *neurovascular entrapment*. This impeded blood flow and disturbance of nerve impulses causes pain, swelling, and burning in the arm, and numbness and tingling in the little finger side of the hand. The collection of symptoms caused by this compression of the nerves and vessels is properly termed *thoracic outlet syndrome*, although it is very often incorrectly diagnosed as carpal tunnel syndrome. Scalene-induced weakness in the forearms and hands that makes you unexpectedly drop things is likely to be ascribed to a neurological defect. Unexplained “phantom pain” in an amputated arm or hand can actually be coming from scalene trigger points (Simons, Travell, and Simons 1999; Sherman 1980).

Given that all these effects occur so far from their source and are so variable, it’s no wonder that their cause is misunderstood. Fortunately, once you do understand that all these things can be coming from the scalene muscles in your neck, the solution is remarkably simple and quick (Simons, Travell, and Simons 1999).

Causes

The scalene muscles attach to the sides of your neck vertebrae and to your top two ribs. The scalenes help stabilize, flex, laterally flex, and rotate the neck, though their main job is to raise the upper two ribs on each side when you inhale. They’re active to some degree in every inhalation, and they work extremely hard when your breathing is labored during vigorous activity, or during coughing and sneezing.

Habitual chest breathing instead of diaphragmatic breathing will overtax the scalene muscles. Simple nervous hyperventilation stresses them, too. People who are prone to emotional tension should expect to find tender trigger points in their scalene muscles. The struggle for breath in people who suffer from asthma or emphysema can promote scalene trigger points, as can a bad cough from pneumonia, bronchitis, allergies, or a common cold. Playing a wind instrument commonly fosters scalene trouble (Simons, Travell, and Simons 1999).

Many ordinary activities cause scalene trouble when overdone to the point of strain. Working for long hours with the arms out in front of the body can be very stressful for them, including working at the computer or driving a car. Pulling, lifting, and carrying heavy loads can be bad. Carrying a heavy backpack is especially rough for the scalenes and for several other muscles not designed for mule duty, such as the trapezius, pectoralis minor, and sternocleidomastoid. The scalenes are among the muscles most abused in sports activities. They are also very likely to initiate and perpetuate satellite trigger points in other muscles (Simons, Travell, and Simons 1999).

You can expect the violent movement of the head during a fall or an auto accident to bring about trigger points in the scalenes. Most of the muscles of the neck are severely affected by whiplash and are often overlooked in the treatment of pain from this type of injury. Apparent neurological symptoms in the upper back, shoulders, arms, and hands that mysteriously persist after an auto accident can often be traced to the scalenes (Simons, Travell, and Simons 1999).

Scalene muscles help manage the weight of the head. Anything that creates an imbalance puts an additional burden on them. For this reason, it’s wise to work to improve posture that may be holding the head off center. Slouching or habitually carrying your head forward is sure to keep trigger points going in these muscles (Simons, Travell, and Simons 1999).

Treatment

The front of the neck should be treated carefully, with awareness of the lymph nodes, arteries, and nerves. Read and follow the advice in chapter 3, Treatment Guidelines, before beginning, including the section “Contraindications: Reasons to Be Cautious,” which includes information on lymph nodes. The brachial plexus nerves and subclavian artery pass between the anterior and middle scalene muscles on the lower half of the neck. Don’t let yourself get too aggressive in this area by treating more than three times a day at first, and don’t press beyond a comfortable 5 on a scale of 1–10. It is possible to irritate the nerves and cause neuritis or inflammation of the nerves. Remember to stay off the pulse of the subclavian artery near the collarbone and familiarize yourself with the location of the carotid arteries as discussed under the sternocleidomastoid muscle section. The front-of-the-neck muscles are very important and doing the massage techniques correctly and with confidence will serve you well throughout your life. Follow the directions in this section to find and accurately massage the muscles.

When trigger points are present, scalene massage feels a little nervy and weird. So how do you know you are not pressing on a nerve? Well, you likely are. There are nerves everywhere throughout the body. You are sitting or standing on some right now. Nerves don’t usually cause intense sensation unless there is problem such as being pinched by a muscle or bone. If you press into a nerve that is severely entrapped (pinched by a muscle) or impinged (pinched by a bone), the sensation goes immediately from a 0 to a 10 on the pain scale. There is no middle ground and you can’t make the massage feel nice. If that happens in the neck, avoid the area and consult a physician, chiropractor, or physical therapist. There may be a bulging disk in the spine that’s causing trouble. Stimulating a less severely pinched nerve can cause numbness and tingling further down the nerves’ path, such as into the hand. Massage can help to release entrapped nerves.

Success in finding and dealing with the scalenes depends on your understanding of their relationship to the sternocleidomastoid muscle (figure 5.4). The *anterior scalene*, the front-most scalene muscle, lies between the sternocleidomastoid and the neck vertebrae and is almost completely hidden. The *middle scalene* is behind the anterior scalene, more on the side of the neck, with its lower half free of the sternocleidomastoid. The *posterior scalene* lies almost horizontally behind the middle scalene in the soft triangular depression just above the collarbone and below the front edge of the trapezius. A fourth scalene muscle, the vertically oriented *scalenus minimus*, is found behind the lower portion of the anterior scalene. Not everyone has a scalenus minimus; it’s a normal human variation. You likely won’t be able to notice a difference between the anterior scalene and the scalenus minimus.

The scalenes cling closely to the bones of the neck. You may not be able tell that they are muscle tissue unless you contract them by taking several short repeated breaths; use this technique to confirm you are on the scalenes. When massaging the scalenes, you will be pressing them against the bony vertebrae behind them. Use only your fingers to massage the front of the neck.

To massage the anterior scalene, you have to get your fingers between the neck vertebrae and the sternocleidomastoid (SCM). See the sternocleidomastoid section in chapter 4 to learn about how to find this muscle. To massage the anterior

Use only your fingers to massage the front of the neck.

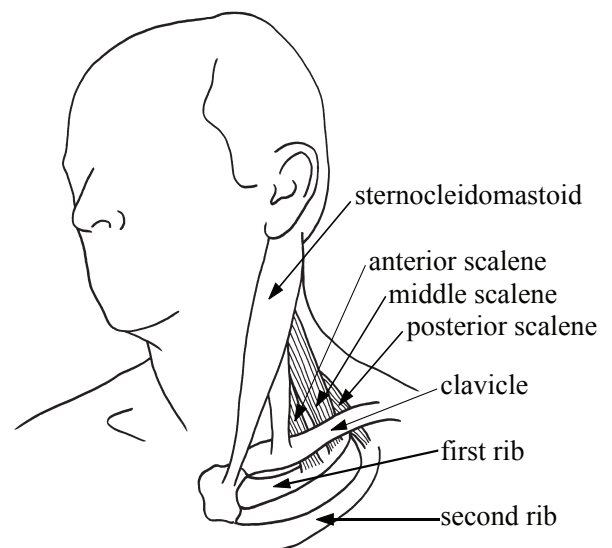


Figure 5.4 Location of anterior, middle, and posterior scalene muscles behind the sternocleidomastoid

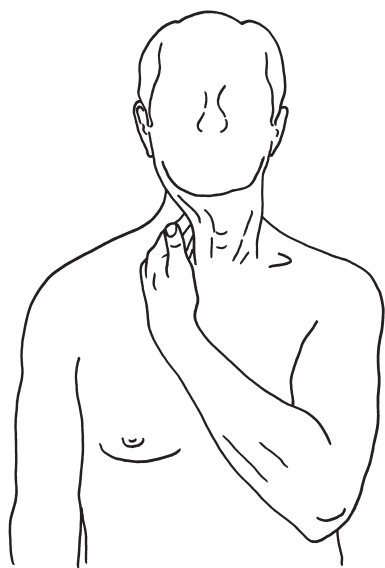


Figure 5.5 Anterior scalene massage. Pull the sternocleidomastoid out of the way, firmly toward the windpipe.

scalene, first grip the SCM between the fingers and thumb, of the opposite hand, as if you were going to massage it. Then let go with your thumb and with your fingers pull the entire SCM about two inches toward the windpipe. The idea is to get your fingertips as far around in front of the vertebral column as you can, with the sternocleidomastoid pulled out of the way. In this position, you can press the anterior scalene against the vertebral column with the tips of your fingers (figure 5.5). You can also pull the SCM out of the way by turning your head to the opposite side. Then relax your neck by slightly tilting back to the same side you are treating.

This will not hurt unless you encounter a trigger point, in which case it can be extremely tender. Remember to make the massage feel “therapeutically delicious” by experimenting with different amounts of pressure. It will be tender, but it should feel good. Pressure on a scalene trigger point can evoke a spooky kind of pain that will make you duck and cringe: it can feel like you’re pressing on a nerve (see below). At the same time, you may feel the referred pain or other symptom being reproduced or accentuated. This can be a very convincing demonstration of the reality of referred myofascial pain.

The massage stroke is executed by pressing with your fingertips as you push them across the muscle toward the side of the neck. The skin of the neck should move with the fingers. At the end of the stroke, which will be only half an inch long, release the pressure, reset your fingers where you began the stroke, and repeat. This procedure should be carried out all along the back edge of the SCM, from up under your jaw clear down to the collarbone. You may find some of your worst scalene trigger points behind the SCM where it attaches to the collarbone (figure 5.6). If this trigger point is bad enough, multiple angles of pressure might be beneficial. Turn your head to the opposite side to find the lowest part of the SCM. Place your finger just above the collarbone and to the outside of the SCM. Turn your head back to neutral, then press behind the collarbone down toward your feet. After massaging at this angle, press toward your low back, then toward the upper back. Give each spot a few stokes of massage. Avoid pressing directly on the subclavian artery here by moving slightly up or to the side. Remember the rule: never massage a pulse. Clipping and filing your fingernails will make this more comfortable.

To massage the middle scalene, find the sternocleidomastoid muscle again. Grasp it with a pinch to find it, then let go with your thumb. Starting just below the ear, press into the side of your neck. The bony knobs under your fingertips will feel bumpy and hard; that is because they are the transverse processes (or sides) of the vertebrae. They almost feel like a row of little midfinger knuckles down your neck. If your fingertips are to the back of these knobs you will be massaging the posterior neck muscles; if they are to the front of these knobby bones, you will be touching the middle scalene (figure 5.7). To confirm that you are on the middle scalene, take several short, quick, repeated breaths in a row to contract it. On the side of the neck here, use



Figure 5.6 Anterior scalene massage deep to the sternocleidomastoid attachment to the collarbone



Figure 5.7 Middle scalene massage behind the sternocleidomastoid

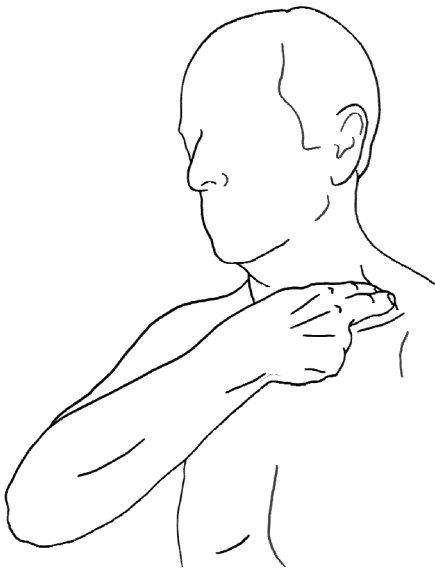


Figure 5.8 Posterior scalene massage, pressing down where the trapezius attaches to the collarbone

the same stroke you used for the anterior scalene. Follow this muscle all the way from just below the ear down to the middle of the collarbone. You may find multiple spots of exquisite tenderness in your scalenes. Ten strokes on each scalene trigger point are enough for one session. Come back to them three to six times during the day.

To massage the posterior scalene, push your middle finger under the front edge of the trapezius muscle near where it attaches to the collarbone (figure 5.8). Exert downward pressure and drag your finger an inch or so toward your neck, parallel to the collarbone. This stroke should move the skin with it. The boniness you feel under your finger as you do this stroke is the top surface of your first rib. Don't neglect the posterior scalene. It can have trigger points when the other scalene muscles do not.

The scalenes are among the most beneficial muscles to massage. Your efforts to master self-treatment of these muscles will be well worth it. The scalenes are likely to be involved in many myofascial pain problems of the upper body. Everyone should know how to treat these muscles.

Be sure to read chapter 3, Treatment Guidelines.

The Shoulder Blade (Scapula)

Seventeen muscles attach to each of your shoulder blades. Finding these muscles for massage is made much easier if you have a clear idea of what a shoulder blade looks like and can find its bony landmarks (figures 5.9 and 5.10). The following is the key to both illustrations:

- A. Superior angle of the shoulder blade (highest point)
- B. Medial border of the shoulder blade (inner edge)
- C. Lateral border of the shoulder blade (outer edge)
- D. Inferior angle of the shoulder blade (lowest point)
- E. Acromion (outer tip of the shoulder blade)
- F. Coracoid process (sticking out through the front of the shoulder)
- G. Head of the humerus and the glenoid cavity (the ball and socket)
- H. Scapular spine (the ridge-like spine of the shoulder blade; also called spine of the scapula)
- I. Humerus (upper arm bone)
- J. Clavicle (collarbone)

With the heel of your hand firmly “glued” to your collarbone, feel for the bony *superior angle* (A) of the top of the shoulder blade (figure 5.11). Swing your arm forward and back loosely to make the superior angle move back

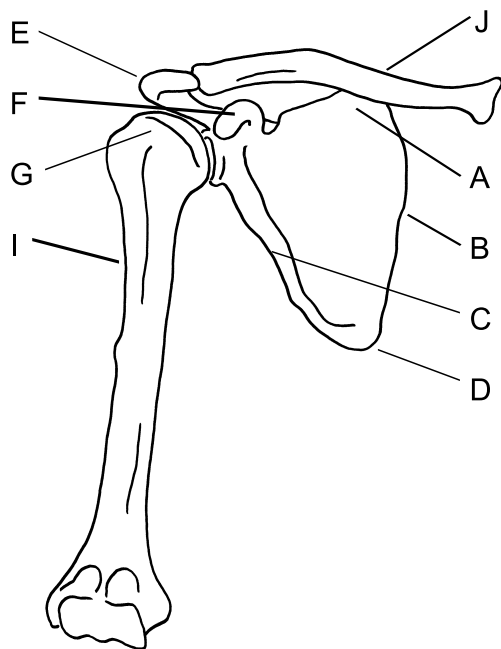


Figure 5.9 Front view of the bones of the right shoulder

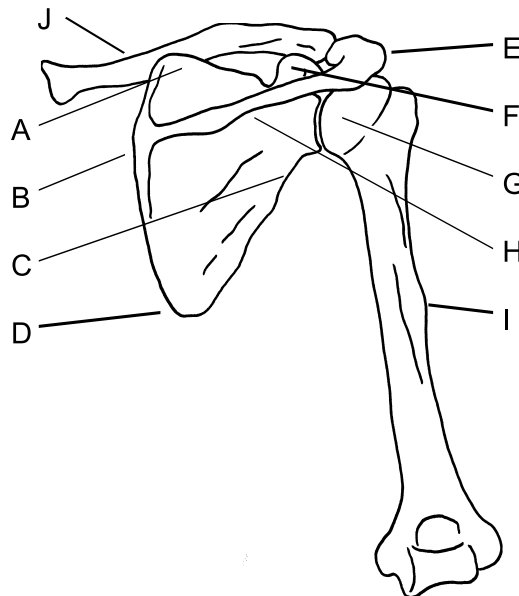


Figure 5.10 Back view of the bones of the right shoulder

and forth under middle or index fingers as they rest on the top of your shoulder. This is an important landmark for locating the *supraspinatus*, one of the four rotator cuff muscles, and the levator scapulae of the upper back.

The most prominent part of the shoulder blade is the *scapular spine* (H). On slender people, you can see it standing out very clearly beneath the skin. The root, or base, of the spine of the scapula is just an inch or so down the back from the superior angle. See if you can feel it and trace along this bony ridge as it crosses the shoulder blade (figure 5.12). On some people, it is nearly horizontal. On others, it angles upward.

Now find the *acromion* (E), the flat shelf of bone at the point of the shoulder. Feel for the more or less sharp point just behind the shoulder but still on top. Under your arm at the back edge of the armpit, you should be able to feel the *lateral border* (C) of the shoulder blade (figure 5.13). This is an important landmark for finding the *teres major*, *latissimus dorsi*, *teres minor*, and *subscapularis* muscles.

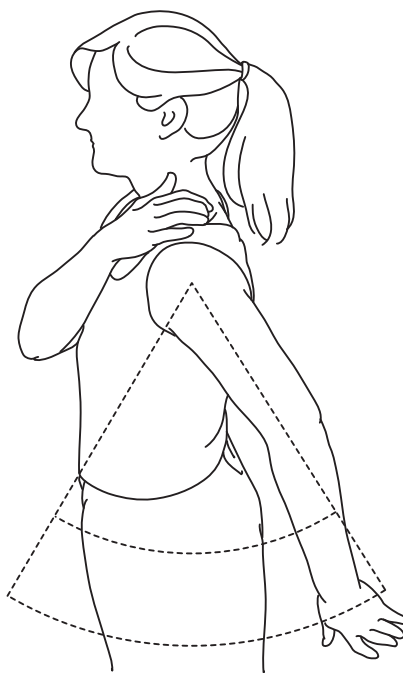


Figure 5.11 Locating the superior angle of the shoulder blade by swinging the arm forward and back. The heel of the opposite hand is “glued” to the collarbone.



Figure 5.12 Locating the spine of the scapula



Figure 5.13 Locating the lateral border of the shoulder blade



Figure 5.14 Locating the inferior angle of the shoulder blade

Trace the lateral border down to the lowest point of the shoulder blade, the *inferior angle* (D). To feel it, move your arm forward and back to make the inferior angle move back and forth under your fingers (figure 5.14). If your range of motion isn't hampered by shoulder pain or a broad chest, try reaching all the way across to touch the inner edge of the shoulder blade, the *medial border* (B) (figure 5.15). Otherwise, try to touch the upper part of the medial border by reaching over your shoulder.

Finally, search for the *coracoid process* (F). It's part of the shoulder blade but runs all the way through the shoulder and sticks out under the skin in front (figure 5.16). The coracoid process feels like a marble nestled in the front of the shoulder beside the head of the humerus. To verify that you are on it, rotate your whole arm medially (in) and laterally (out) to feel the humerus move next to the coracoid process (Davies 2006). Be cautious of nerves and blood vessels that run just below this bony landmark of the shoulder. Take some time to learn the terms for the different parts of the shoulder blade. It will aid your comprehension of the discussion of the individual muscles and, ultimately, your ability to successfully treat your trigger points.



Figure 5.15 Locating the medial border of the shoulder blade

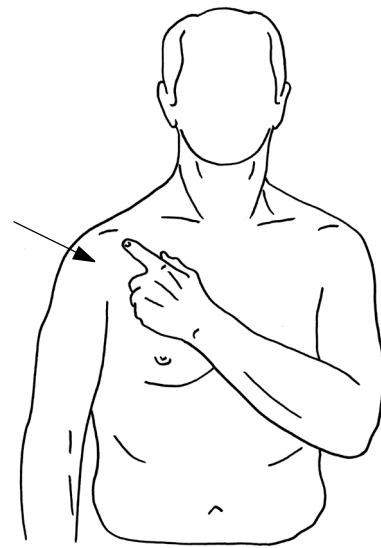


Figure 5.16 Touching the coracoid process. The arrow points to the head of the humerus.

Upper Back Muscles

Putting muscles into logical groups is easy if you're viewing the question anatomically. All you have to do is decide the physical boundaries. When you try to group muscles according to the referred pain caused by their trigger points, it's like shuffling a deck of cards. Everything changes. This is why certain upper back muscles have ended up in other chapters in this book. Only three upper back muscles primarily cause symptoms where they are located. They are the rhomboids major and minor and the serratus posterior superior. The upper spinal muscles, which do cause pain in the upper back, have been left to the chapter on the lower back and buttocks (chapter 8), because they're simply a continuation of the muscles in those parts of the body.

Rhomboids

The *rhomboid* (RAHM-oid) muscles attach to several vertebrae of the upper back and to the inner edge of

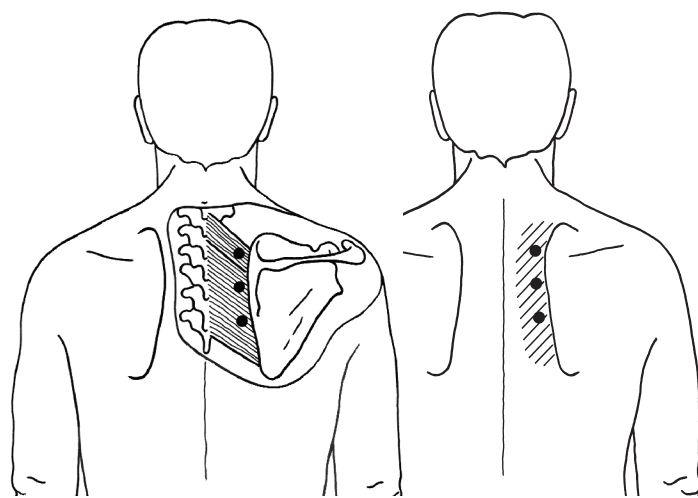


Figure 5.17 Rhomboid trigger points and referred pain pattern

the shoulder blade. The rhomboid minor is higher and somewhat separate from the rhomboid major, but the two are indistinguishable by touch. The function of the rhomboids is to move the shoulder blade toward the spine, to help raise the shoulder blade, and to bring the arm down from straight overhead to the level of the shoulder.

Trigger points in the rhomboids cause an aching kind of pain along the inner edge of the shoulder blade, which may become more noticeable at rest (figure 5.17). A significant amount of pain at this site may also be coming from the serratus posterior superior muscle, which lies beneath the rhomboids, and from the middle trapezius covering them. There may be trigger points in all three layers. Other muscles that send pain to the inner edge of the shoulder blade include the scalenes, infraspinatus, latissimus dorsi, serratus anterior, and

levator scapulae. The spinal muscles (discussed in chapter 8) cause pain at this same level but nearer to the spine.

It's important to check for trigger points in your scalenes before going to the trouble of treating all these other muscles. The scalenes are among the most common sources of pain along the inner edge of the shoulder blade. Without first taking care of the scalenes, massage applied to the rhomboids or to any of the other muscles listed here, though it may feel good, can be a complete waste of time. A symptom that may help verify rhomboid involvement is the sound of snapping or crunching in them during shoulder movement (Simons, Travell, and Simons 1999).

To avoid overusing the rhomboids, it's wise to moderate any activity that requires continuously or repeatedly raising the shoulders. The unnatural military posture of keeping the shoulders pulled back requires that the rhomboids remain continuously contracted. Throwing a ball or rowing a boat can exhaust the rhomboids. Habitual tension that keeps the shoulders up stimulates formation of trigger points in many muscles, including the rhomboids. If you would like to learn how to deal more effectively with habitual muscle tension, see chapter 12.

A cause of trouble in the rhomboids that might never occur to you is tight pectoral muscles. This was the case for Curtis.

Curtis, a contractor and home builder from New England, lived with chronic pain in his upper back for over five years. During that time, he sought help from twenty-three doctors and physical therapists. All of them told him the pain in the upper back was coming from the rhomboids. Treatment included stretching of the rhomboids, ultra-

sound, heat and cold therapies, and rest. At one point, he took off work for a year, hoping for relief. In the end, he decided he might as well go back to work since he was going to hurt either way.

Finally in desperation, Curtis tried massage therapy. The therapist asked him to lie on his back on the massage table so he could work on his pectoralis muscles. Curtis thought this was ridiculous since the pain was in his back, not his chest. The therapist explained that overly tight pectoral muscles were creating a strain on the rhomboids and middle trapezius muscles. As a young man, Curtis had spent quite a bit of time strengthening the front of his body, including his pecs. Decades later, these muscles remained short and tight. The therapist recommended Curtis buy *The Trigger Point Therapy Workbook* and self-treat his pectoral muscles and scalenes daily in between weekly sessions with him. Within a month, 95 percent of his pain was gone. Strengthening the upper back muscles and stretching the pectoral muscles soon got him in balance and pain free. He was delighted.

Trigger points keep the pectoral muscles shortened, which causes them to pull the shoulder blade forward. This is usually due to a strength and length imbalance between the rhomboids and pectoralis muscles. The rhomboids are stretched to counter the pull of the pectoral muscles. This overstretching will cause trigger points to form in the muscles (Simons, Travell, and Simons 1999).

The pull of tight pectorals causes your shoulder blades to stick out in back and gives you a round-shouldered posture. It's very difficult to correct your posture or to give relief to the rhomboids without first deactivating trigger points in the pectoral muscles. Attempts to stretch the rhomboids when they're already weakened by the pectoral muscles can strain them even further, irritating their trigger points and making the pain worse (Simons, Travell, and Simons 1999; Kendall, McCreary, and Provance 1993).

Treat the rhomboids after you've ruled out scalene and pectoralis trigger points. Rhomboid massage can be applied easily and efficiently with the Thera Cane, although a tennis ball against a wall is an easier tool. Use a high bounce or lacrosse ball for greater pressure and even more control. Trigger points in the rhomboids are easily confused with ones in the lower trapezius, which may also be overstretched from chronic rounded-shoulder posture.

Serratus Posterior Superior

Although the *serratus* (seh-RAY-tus) *posterior superior* muscles attach to the spine like the rhomboids and run in the same direction, they don't attach to the shoulder blade. Instead, they go underneath the shoulder blade to connect with several upper ribs (figure 5.18). The serratus posterior superior muscles raise the ribs during inhalation to help fill the lungs. The word "serratus" means "saw-toothed," which relates to its appearance, sequentially attached to several ribs. The word "superior" means that it is the highest of the serratus muscles.

The pain pattern of the serratus posterior superior is very broad (figure 5.19) and overlaps the patterns of a great number of other muscles. A deep ache under the shoulder blade is the most characteristic symptom. Sharp pain during inhalation is also a sign of a trigger point in this muscle. Pain may also be felt in the back of the shoulder, the point of the elbow, and the little finger side of the wrist and hand. Pain in the little finger is a signature of serratus posterior superior trigger points. Occasionally, pain may occur over the back of the upper arm and forearm and even in the pectoral area (not shown) (Simons, Travell, and Simons 1999).

Strenuous breathing during sports activity, nervous hyperventilation, or habitual chest breathing can create trigger points in these muscles. Especially taxing for them is the struggle for breath in respiratory illnesses such as asthma, bronchitis, pneumonia, emphysema, and smoker's cough (Simons, Travell, and Simons 1999).

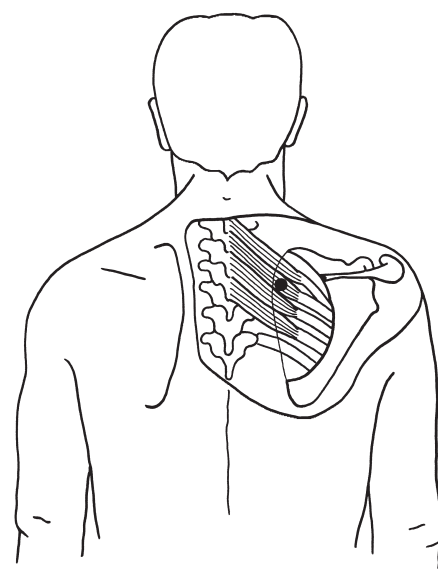


Figure 5.18 Serratus posterior superior trigger point

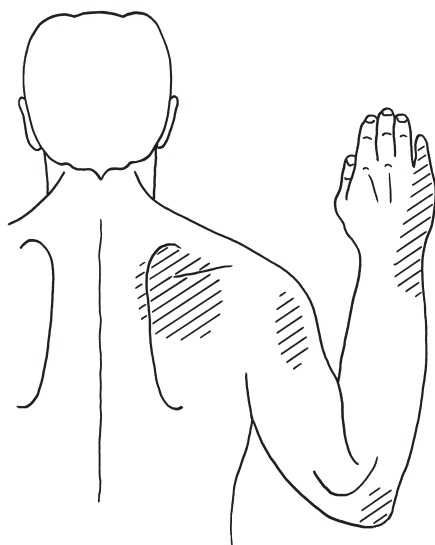


Figure 5.19 Serratus posterior superior referred pain pattern



Figure 5.20 Serratus posterior superior massage with the ball on a wall (hand on opposite shoulder)

Because the serratus posterior superior is largely hidden by the shoulder blade, its trigger points are normally inaccessible. The big bite taken out of the shoulder blade in figure 5.18 illustrates this. Luckily, the shoulder blade can be moved out of the way by simply reaching the hand across to the opposite shoulder. A tennis, 60 mm high bounce, or lacrosse ball on a wall all work well to massage this muscle, provided the hand is resting on the opposite shoulder (figure 5.20). This trigger point is just down from the superior angle of the shoulder blade, right next to the shoulder blade.

Shoulder Muscles

Think about all the things human beings can do with their hands. The diversity is truly awesome, particularly in sports and the arts. In our world of rapidly proliferating technological devices, human hands and fingers are called on daily to manage subtle, new operations. All of these widely varied actions of the hands depend directly on the strength of the shoulder joints and their ability to move freely.

Moving the arm into an infinite variety of positions requires extremely fine coordination among all the muscles involved. There are twenty-four muscles that affect the function of each shoulder, including the scalene muscles in each side of the neck. Tight scalenes can cause compression of the nerves and blood vessels that supply the shoulders, arms, and hands (Davies 2006). Shoulder trouble takes a predictable course. When a shoulder muscle is weakened and made dysfunctional by trigger points, associated muscles have to take up the slack. Under the extra burden, they fall like dominoes, each acquiring trigger points in turn, until every muscle in the region has joined the party.

Simple chores become impossible. You can no longer scratch your back, comb your hair, or reach up to get the cereal off the shelf. If you need two hands for something, you have to use your good arm to lift your bad one. You may not even be able to reach across your body to fasten your seat belt. Constant pain disturbs your sleep and makes your job miserable. In its fully developed state, shoulder trouble can persist for months, and sometimes for years (Simons, Travell, and Simons 1999; Bonica and Sola 1990).

Shoulder trouble can be extremely frustrating when therapists don't understand shoulders and don't fully treat the muscles that move the joints. Pain from trigger points and the resulting joint dysfunction can last for years. Some people get lucky and the pain goes away due to limited use, but often the range of motion remains very limited. In other cases, like Jeannie's, the pain persists for years.

Jeannie, age forty-five, experienced pain in both shoulders after trying to catch herself during a fall on the stairs where she worked. Doctors offered only two options: cortisone shots or exploratory surgery, both of which she declined. She went through two ineffective courses of physical therapy and then settled into getting professional massage once a month. The “feel good” massage was relaxing but did little to relieve her chronic shoulder pain. She lived with her shoulder trouble for the next fifteen years. In a class on the self-treatment of pain, Jeannie discovered trigger points in all of her rotator cuff muscles. The massage techniques she learned in class brought more relief from her shoulder pain than she’d had from any previous treatment. It took her several weeks to unload all of the muscles harboring trigger points, but in the end she had full range of motion and no more pain.

Diagnosis for shoulder conditions usually focus on the joint: arthritis, bursitis, tendinitis, rotator cuff injury, adhesive capsulitis, and so on. Adhesive capsulitis is just one of the many labels that doctors apply to the problem known as frozen shoulder syndrome. Adhesions are made from a fibrinous glue that develops over time into more permanent collagen and then ultimately into scar tissue. This process usually takes place after tissue injury or surgery. Although it is possible for adhesions to form in the glenohumeral joint of the shoulder, it usually takes months or years of immobility for them to develop and some people never get them. Even then these adhesions may be released by slow, gentle, pain-free manipulation of the joint by a trained manual therapist. Some orthopedic massage therapists are trained to perform a mortar-and-pestle-like technique to gently massage and stretch the deep fascia inside the joint. Before this technique is done, all of the muscles of the shoulder are massaged and the trigger points released (Waslaski 2012). You can release the trigger points yourself, and, by doing so, you will improve your range of motion, greatly reduce your pain, and also reduce the likelihood that you will develop true adhesive capsulitis. It’s easy to understand the importance of a healthy ball-and-socket joint in positioning the hand and arm for a virtually unlimited variety of actions and operations. Movement of the ball in the socket is the essential action in the shoulder, but movement of the shoulder blade is just as important, if not more so. Think of the shoulder blade as a kind of platform for a crane, the crane being the arm. The shoulder joint is the place where the crane swivels to maximize the range of motion of the arm; the shoulder blade, lacking the restriction of ligaments, moves freely on the back. To gain this freedom requires an elaborate arrangement of the powerful muscles on both the front and the back of the trunk harnessing and controlling the shoulder blade. Of the twenty-four muscles involved with the shoulder, seventeen attach to the shoulder blade. All of them have an effect on the positioning and function of the shoulder complex. Just like a cascade of dominoes, many muscles can become involved when there is a significant imbalance in one (Davies 2006).

The four rotator cuff muscles are the most frequent cause of shoulder pain, loss of upper arm motion, and clicking or catching in the joint. The rotator cuff is made up of the tendons of these four extraordinarily important muscles that cover the inner and outer surfaces of the shoulder blade. *Tendons* are the strong fibrous end of the muscles that anchor them to the bones. When there is an issue at the tendon, it is likely that the problem is in the corresponding muscle (Davies 2006).

Of the twenty-four muscles involved with the shoulder, seventeen attach to the shoulder blade.

When you’re able to manage the trigger points in these muscles yourself, you may be able to avoid forced manipulation of the shoulder, steroid injections, and harsh physical therapy. Exercise and stretching, the most common form of physical therapy for shoulder problems, often yield disappointing results when the rotator cuff muscles are stiff and resistant. The safest and most direct and effective therapy for shoulder pain is specific trigger point massage of these muscles. Even when surgery must be done to correct a genuine structural problem, massage of the trigger points in the rotator cuff muscles is vital for eliminating residual pain (Simons, Travell, and Simons 1999; Danneskiold-Samoe, Christiansen, and Andersen 1983).

Be sure to read chapter 3, Treatment Guidelines to learn how to do the massage.

Supraspinatus

The *supraspinatus* (soo-prah-spih-NAH-tus) is buried in a pocket in the top of the shoulder blade above the scapular spine (figure 5.21). The word “supraspinatus” means “above the spine.” At its outer end, the muscle passes

under the acromion and crosses over to attach to the outer side of the top of the head of the humerus. This attachment gives the supraspinatus great leverage for helping raise the arm. It also allows the muscle to help the other rotators hold the joint together.

Pain in the outer shoulder will tempt you to expend energy massaging the deltoid muscle. Deltoid massage is easy, feels great, and may even do some good, but it won't fix your shoulder pain if it's coming from the supraspinatus. Supraspinatus trigger points can be at the heart of an otherwise unexplainable problem.

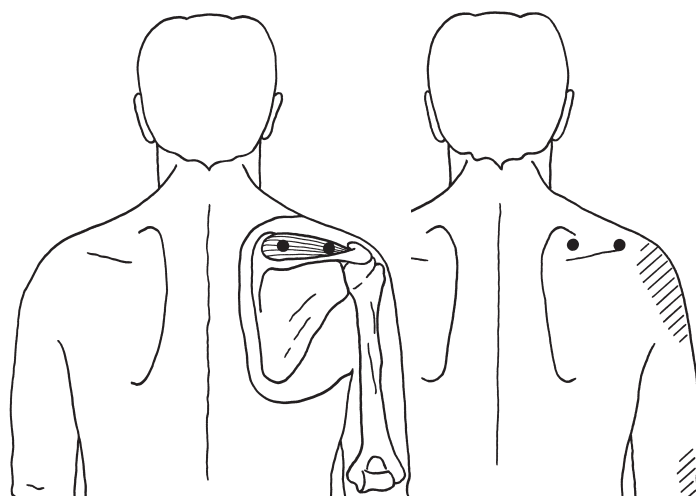


Figure 5.21 Supraspinatus trigger points and referred pain pattern

Erik, age fifty-five, took a bad fall while skiing. Eighteen months later, he still felt the effects in the outside of his left shoulder and in his left elbow. He couldn't raise his arm without the most excruciating pain. Sometimes it hurt just to walk across the room

with his arm hanging at his side. Playing the piano, something he had always done on weekends for extra income, became an unpleasant ordeal. After many tests, Erik's doctor still wasn't sure what was wrong. A knowledgeable friend applied pressure to an extremely tender spot in the supraspinatus muscle of Erik's left shoulder blade, reproducing the pain in his elbow and shoulder. He was shown how to massage the muscle himself. Within three weeks, by his own efforts—after a year and a half of misery—his pain was finally gone.

Symptoms

Pain from supraspinatus trigger points is felt primarily at rest as a deep ache in the outer side of the shoulder (figure 5.21). Occasionally, pain spreads to the outer side of the upper arm and forearm and into the wrist (not shown). It can be painful even to start to raise your arm. Putting your arm overhead is next to impossible. It becomes a problem to wash or comb your hair. These difficulties and the pain causing them are frequently misdiagnosed as bursitis (Simons, Travell, and Simons 1999; Bonica and Sola 1990).

Supraspinatus trigger points are to blame for the clicking or popping that is sometimes felt or heard in the shoulder joint. The muscle is kept so tight that the head of the humerus is prevented from gliding smoothly in its socket. The popping stops when the trigger points are deactivated (Simons, Travell, and Simons 1999).

The supraspinatus is also one of many sources of the pain in the outer elbow known as “tennis elbow.” Although commonly given such catchall diagnoses as arthritis, tendinitis, or inflammation, tennis elbow is often just referred pain from myofascial trigger points that can be treated very effectively with massage. Trigger points in the triceps or one of the forearm muscles are the most usual cause of tennis elbow. Supraspinatus trigger points, being so far away and a less frequent cause, are generally overlooked as a source of this common pain (Simons, Travell, and Simons 1999).

Causes

The supraspinatus is commonly overloaded during a onetime incident of extreme exertion, such as moving a large couch or carrying heavy weight like boxes or suitcases. The supraspinatus muscles have to work extraordinarily hard to keep the shoulder joints from pulling apart, especially when you carry something like a suitcase with your arm hanging straight down. Repetitive strain such as working with the arms overhead for long periods of time or typing at a computer keyboard with no elbow support can also exhaust supraspinatus muscles. The simple act of swinging your arms while walking can add an intolerable degree of strain on the supraspinatus when it's already in trouble. A fall can also initiate supraspinatus trigger points. So can a large, strong, eager dog that can't be broken of pulling on the leash (Simons, Travell, and Simons 1999; Hagberg 1981).

Treatment

You will find the supraspinatus muscle at the top of the shoulder blade, immediately behind the thick roll of the trapezius muscle that lies on top of the shoulder. Review finding the landmarks in “The Shoulder Blade” section above. Find the superior angle and the spine of the scapula. If your hand is in the right place, your fingertips will be contacting the top edge of the scapular spine and the heel of your hand will be on your collarbone. To verify that you're touching the supraspinatus, begin to raise your arm forward and a little to the side. Just as your arm starts to move, you should feel the muscle contract and bulge up under your fingers. If not, move your finger slightly to the outside.

Trigger points occur in two places in the supraspinatus (figure 5.21). One is in the belly of the muscle, just below the superior angle of the shoulder blade. It is easy to confuse this trigger point with one in the levator scapulae, so palpate carefully. If massage feels *really* good, you are likely to be on the levator. The second trigger point is about two inches farther out, near where the muscle dives under the acromion, the bony point of the shoulder. The trigger point is right in the bony V formed by the scapular spine and the collarbone, which come together at this spot. This point can be acutely tender, just like a bruise. Try to make the massage feel comfortable, not to the point of squinting your eyes or grimacing.

The sensitivity of the fingers is helpful for locating trigger points in the supraspinatus, but massage with the fingers is not worth the strain. The Thera Cane or Backnobber are better tools (figure 5.22). It helps to first guide the knob carefully into place with your fingers, feeling for the superior angle of the shoulder blade and the scapular spine. With either tool, the opposite hand in the bow gives you the greatest leverage for digging into this deeply situated muscle.

It's conceivable that you'll need some help in dealing with the supraspinatus. If so, a partner standing behind you (with you seated) can get to the supraspinatus with paired thumbs, supported fingers, or a Knobble.

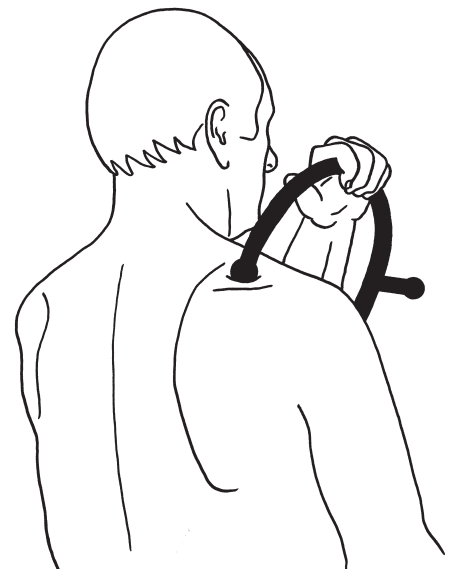


Figure 5.22 Supraspinatus massage with the Thera Cane (opposite hand in the bow)

Infraspinatus

The *infraspinatus* (in-frah-spih-NAH-tus) covers almost all of the shoulder blade below the scapular spine (figure 5.23). The word “infraspinatus” means “below the spine.” At its outer end, the infraspinatus attaches to the back of the head of the humerus, giving it the ability to rotate the arm outward, as when you pull your arm back to throw a ball or prepare to make a forehand stroke with a tennis racket. Without outward rotation, the arm can't

be raised above the level of the shoulder. The infraspinatus is also a strong participant in keeping the head of the humerus in its socket.

The infraspinatus is one of the most frequently afflicted muscles of the body. It's capable of ending an athletic career, as illustrated by Kim's story.

Kim was a thirty-two-year-old professional tennis coach who had lived with pain in both shoulders ever since she began playing tennis as a child.

Diagnosed with rotator cuff tendinitis, Kim had had numerous steroid injections and was going for physical

therapy almost weekly. Despite the treatments, pain kept her from playing much of the time. She was very concerned that several of her young players were developing shoulder pain very similar to her own. "I make them play through the pain, just like we were told to do at their age," she said. "I'm afraid they'll end up as tennis cripples like me, but I don't know what else to do. They want to play so badly." After a massage therapist showed Kim how to self-treat her shoulder with a tennis ball against a wall, she became free of shoulder pain for the first time since the age of fourteen. She felt that the best part about the new trick was that she could pass it on to her students.

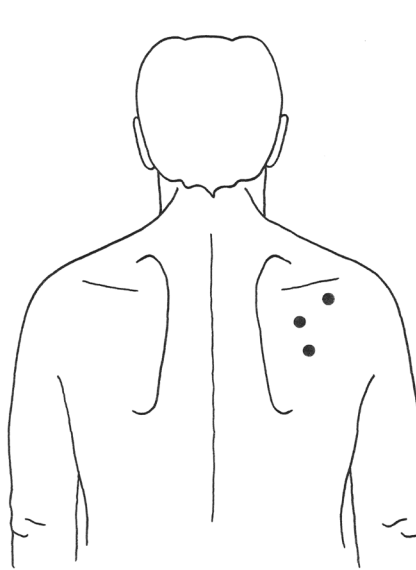


Figure 5.23 Infraspinatus trigger points for shoulder pain

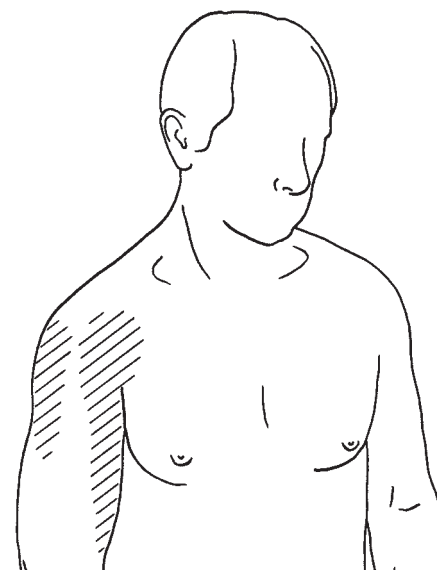


Figure 5.24 Infraspinatus referred pain pattern

Symptoms

Paradoxically, though located behind the shoulder, infraspinatus trigger points are the most common source of pain in the front of the shoulder (figure 5.24). This pain usually feels like it's deep in the joint and may travel some distance down the biceps. Extreme tenderness in the anterior deltoid and the bicipital groove in the head of the humerus can lead to an erroneous diagnosis of bicipital tendinitis. Pain can also shoot down the outer side of

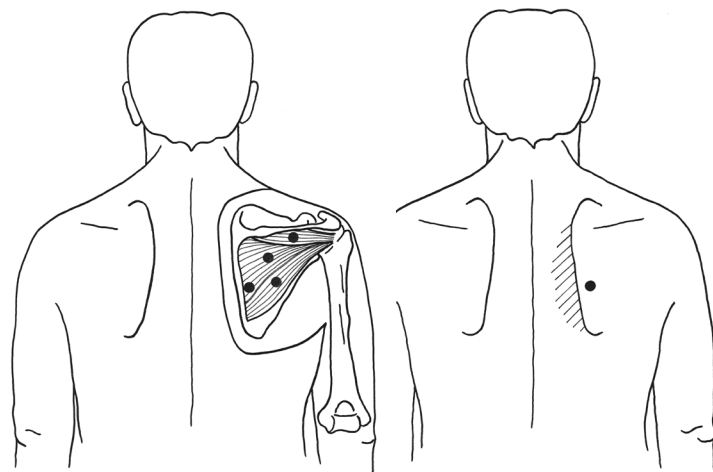


Figure 5.25 Infraspinatus medial border trigger point with referred pain pattern

the shoulder. Occasionally, the trigger point just inside the medial border of the shoulder (figure 5.25) will refer pain to the back of the neck and to the upper back next to the shoulder blade, all the way down the upper arm and forearm, and into the entire thumb side of the hand. When pain is referred to the forearm it tends to promote formation of satellite trigger points in the hand and finger extensors, compounding pain and other symptoms in the hand. It is also possible to develop *hyperhidrosis*, or excessive sweating, within the referred pain zone and even down into the hands (Simons, Travell, and Simons 1999; Pace 1975).

Other symptoms of infraspinatus trigger points include weakness and stiffness in the shoulder and

arm, which can cause your shoulder and arm to tire easily. Both inward and outward rotation of the arm are restricted, making it difficult to move the arm in any direction. Since arm rotation is necessary for reaching behind you, it becomes impossible to reach up behind your back. A woman can't fasten or unfasten her bra. You struggle getting your jacket on or off. Lying on the afflicted shoulder is painful. Lying on the opposite side is painful as well, because the weight of the afflicted arm pulls on the infraspinatus. Even reaching up to comb your hair or brush your teeth may be painful (Simons, Travell, and Simons 1999; Sola and Williams 1956).

The internal rotator muscles, the subscapularis, and the pectoralis major can instigate trouble in the infraspinatus and teres minor. If the subscapularis and pectoralis major are short, tight, and have trigger points, the infraspinatus and teres minor become overstretched. The latter two muscles then develop a compensation pattern of trigger points. The infraspinatus may be responsible for much of the referred pain you experience, but if you don't resolve the trigger points and the shortening in the opposite muscles, you won't solve the problem. Deactivate all of the trigger points before starting a stretching protocol.

It is possible for many of the shoulder muscles to end up with trigger points and soon you're unable to move the arm much at all. The rigidity of the shoulder imposed by the stiffness of the muscles can give your doctor the idea that you have adhesions in the joint or adhesive capsulitis, which can lead to a recommendation for forced manipulation under anesthesia. Nevertheless, this condition, commonly called a "frozen shoulder," can often be treated very successfully with trigger point massage of the rotator cuff muscles and other associated muscles (Simons, Travell, and Simons 1999).

Causes

Working at a job that requires keeping the arms overhead or out in front for long hours is abusive to the infraspinatus muscles since they have to stay contracted to keep the arms up. Repeatedly reaching back in work or play can leave the infraspinatus in a shortened state and full of trigger points. Accidents, falls, and many kinds of sports activity can overload the infraspinatus. Driving a car with the hands on the top of the wheel puts continuous strain on both the infraspinatus and the supraspinatus, since they work together to keep the arms up (Simons, Travell, and Simons 1999; Baker 1986).

For the same reason, working at a computer keyboard without elbow support easily exhausts both muscles. Keeping your hand on the mouse far out to one side can be the cause of your chronic shoulder pain on that side, since this position requires outward rotation of the upper arm and continuous contraction of the infraspinatus and teres minor. Study your activities to discover other ways an infraspinatus muscle may be involved in a habitual overload or repetitive strain, related to its function in outward rotation of the arm. Seek solutions to eliminate or minimize these perpetuating factors.

Treatment

The infraspinatus, being on the outside of the shoulder blade, is an easy muscle to treat with self-applied massage. Confirm its location by feeling it contract and bulge as you move the arm into outward rotation (figure 5.26). The Thera Cane works well for infraspinatus massage, as does the Backnobber. You may like a tennis, high bounce, or lacrosse ball against a wall even better (figure 5.27). If using the ball against a wall, place the ball just below the spine of the scapula and turn your body to about a 45-degree angle so your "wing," or shoulder blade, is against the wall. If your back is flat against the wall, you are missing the point. Search around for the two trigger points just below the spine of the scapula. Then feel with your fingers for the edge of the muscle that parallels the lateral border of the shoulder blade. In the middle of this finger-like strand of muscle, you will find the trigger point that sends pain to the front of the shoulder. Ten to twelve massage strokes per trigger point constitute a treatment, but come back to it several times a day. Read chapter 3, Treatment Guidelines, for more massage instructions.

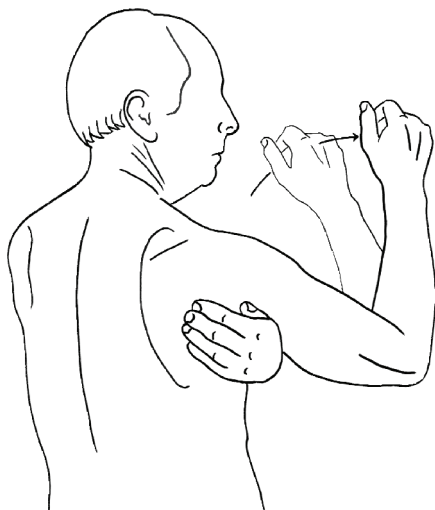


Figure 5.26 Arrow shows outward rotation for locating infraspinatus with isolated contraction. It is the same motion as hitchhiking.

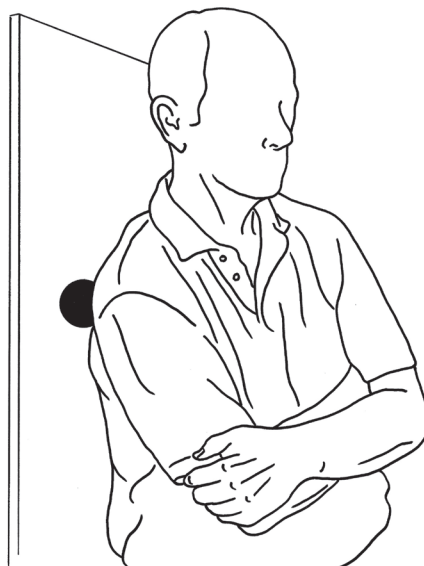


Figure 5.27 Infraspinatus massage with a ball on a wall

The infraspinatus is an especially sneaky muscle. You'll rarely experience pain in the infraspinatus itself. You'll find yourself rubbing away at the front or outer side of your shoulder, forgetting that infraspinatus trigger points are often the cause of pain felt there. You won't know the infraspinatus is the culprit until you press on it.

Be wary of exercising and stretching the infraspinatus or any of the other shoulder muscles until the trigger points have been taken care of. Trigger points in the infraspinatus are unusually irritable, making stretching counterproductive as therapy. A therapist may insist on the need for exercising the shoulder, but the weakness and stiffness that seem to be the problem are actually part of the protection the trigger points are trying to provide. Muscle strength comes back quickly when trigger points are deactivated. Exercise and stretching are helpful for getting your range of motion back, but not until the trigger points are gone.

Teres Minor

The *teres* (TEH-reez) *minor* muscle lies right below the infraspinatus on the shoulder blade and has a similar attachment to the back of the head of the humerus (figure 5.28). The teres minor helps the infraspinatus rotate the arm outward.

The pain pattern for the teres minor is very different from that of the infraspinatus; it refers primarily to a very confined spot on the back of the shoulder in the area of its attachment to the humerus. Pain from trigger points in the teres minor may not be noticed until after more oppressive problems with other shoulder muscles are dealt with.

Teres minor trigger points can also be the cause of a worrisome numbness or tingling in the fourth and fifth fingers. Note that a comparable pattern of finger numbness can also come from trigger points in the pectoralis minor. Pain instead of numbness in these two fingers suggests latissimus dorsi trigger points (Simons, Travell, and Simons 1999).

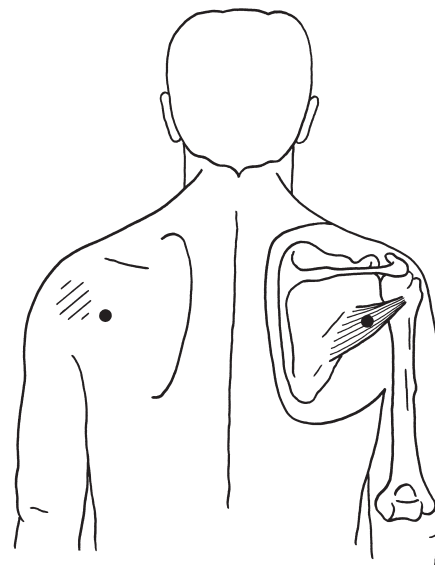


Figure 5.28 Teres minor trigger point and referred pain pattern

The place to find teres minor trigger points is right at the upper lateral border of the shoulder blade. See “The Shoulder Blade” section above for instructions detailing how to find the lateral border. As you rotate your arm outward, as you did for the infraspinatus (figure 5.26), feel the muscle bulge up at the outer border at the very end of the motion. To find the trigger point against the lateral border, measure about an inch up from the armpit. The teres minor can be massaged with the same techniques as the infraspinatus. A tennis, high bounce, or lacrosse ball against the wall is the perfect tool: roll it slowly back and forth across the teres minor against the wall (figure 5.29).

If pain persists in the back of the shoulder after teres minor trigger points have been deactivated, consult this chapter’s Pain Guide for the many other muscles that refer pain to this same place. You may also find it important to deactivate trigger points and stretch the pectoralis major and minor muscles.

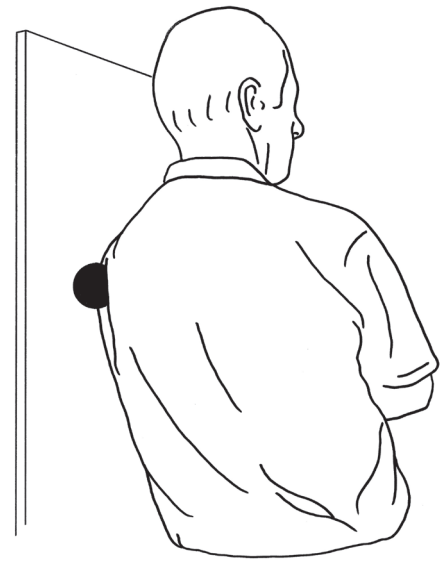


Figure 5.29 Teres minor massage with a ball against a wall

Subscapularis

The *subscapularis* (sub-scap-yu-LEHR-us) is an exceptionally powerful muscle lining the front of the shoulder blade (figure 5.30). Visualize this muscle sandwiched between the shoulder blade and the ribs. (In the illustration, the ribs have been removed and you’re looking through the body to the back.) The muscle’s attachment to the head of the humerus allows it to rotate the arm inward, as if putting something in your back pocket. This attachment also enables the subscapularis to help keep the joint together and the head of the humerus centered in its socket.

You’d think that the subscapularis muscle would be unreachable and untreatable, buried as it is on the front side of the shoulder blade. Actually, it’s surprisingly accessible if you go about it in the right way. This is good news, because the subscapularis is often at the very heart of the problem with shoulder pain. With a frozen shoulder in particular, knowing how to treat subscapularis trigger points can be the key to recovery; without this knowledge, recovery can be a very long time in coming (Simons, Travell, and Simons 1999; Cantu and Grodin 1992; Voss, Ionta, and Myers 1985).

Bernie, age forty-eight, endured pain in his left shoulder for several months. The problem had begun when he tripped and fell while picking up broken branches after a storm. His shoulder ached all the time and woke him repeatedly in the night. He stopped even trying to raise his arm and dreaded putting on his shirt in the morning. He hated the idea of going to the doctor, but the problem wasn’t getting any better. Bernie’s wife gave him a gift certificate for a massage and, to her great surprise, he went. The therapist worked on an extremely tender place under his arm and then showed him how to massage the spot himself. His shoulder was better right away, which encouraged him to continue working on it on his own. When asked at work three months later how his shoulder was doing, he realized he’d had no pain in quite a while. To test it, he raised his arm all the way up. “I’d forgotten about it,” he said. “I don’t even think about it anymore.”

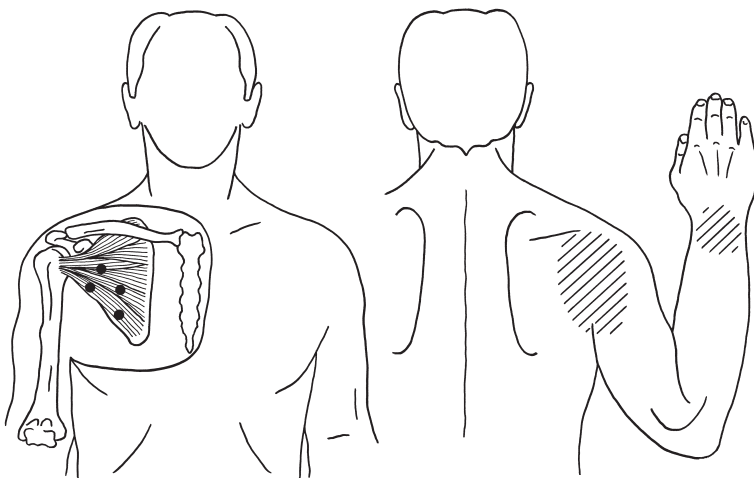


Figure 5.30 Subscapularis trigger points and referred pain pattern

Ruth's shoulder trouble came about in a very different way. At age sixty-seven, she had decided to pursue her lifelong dream of learning to play the banjo. But soon after her first lessons, she began having pain behind her left shoulder whenever she sat down to practice. It hurt just to stick her arm out to hold the neck of the instrument. Luckily, her teacher knew something about trigger points, having had problems of his own. He explained that the position of the left hand when playing a banjo, guitar, or even a violin requires maximum outward rotation of the left arm. To permit this, the subscapularis muscle has to lengthen all the way, which can be a terrific strain if you try to practice too long and the muscle isn't strong and resilient. "And then you get trigger points," he told her. After he showed her how to do self-applied subscapularis massage, Ruth was able to continue playing her banjo, pain free, as long as she didn't overdo it.

Symptoms

The main symptom of subscapularis trigger points is severe pain deep in the back of the shoulder (figure 5.30). An ache in the back of the wrist is occasionally present and could be seen as a signature of subscapularis trigger points. Sometimes the shoulder pain extends down the back of the upper arm (not shown). You may also have an extremely tender spot on the front of your shoulder where the troubled subscapularis has been continuously pulling and jerking on its attachment to the humerus (Simons, Travell, and Simons 1999).

The pull of the four rotator cuff muscles must be in balance in order for the shoulder joint to operate smoothly and freely. A subscapularis muscle weakened by trigger points allows the supraspinatus to pull up on the head of the humerus unopposed, jamming it against the acromion. A clicking or popping noise when you move your shoulder indicates probable trigger points in the subscapularis or the supraspinatus, or both (Simons, Travell, and Simons 1999; Lippitt and Matsen 1993).

Subscapularis trigger points also keep the muscle from lengthening, reducing the shoulder's range of motion and restricting rotation of the arm in either direction. This makes it difficult to reach above your head, across your body, or up behind your back. The disabling pain and stiffness caused by subscapularis trigger points are commonly mistaken for bursitis, arthritis, bicipital tendinitis, rotator cuff injury, and adhesive capsulitis (Simons, Travell, and Simons 1999).

Causes

A sudden unprepared overloading of the shoulder muscles, such as might occur during a fall, is especially likely to make trouble for the subscapularis. Your shoulders are more vulnerable to this kind of accident when you're an older person, overweight, or simply out of shape. Another common cause for the development of subscapularis trigger points is prolonged immobilization of the shoulder for healing of a broken arm. Stroke victims who have lost the use of an arm often develop subscapularis trigger points because of inactivity. Recovering from a tear to the rotator cuff can make trigger points in the subscapularis, as can the initial injury. Dislocating the shoulder can also cause trigger points (Simons, Travell, and Simons 1999).

Trigger points commonly develop in the subscapularis when you overexert yourself during exercise or sports activity without proper conditioning. Lifting a child overhead and then swinging her down between your legs and up again will activate subscapularis trigger points. Fitness enthusiasts, swimmers, tennis players, and ball throwers of all kinds are in special danger of abusing their subscapularis muscles. Pitchers who have to retire prematurely because of chronic shoulder pain might well be able to return to the mound if their subscapularis and other shoulder muscles were given some trigger point therapy (Simons, Travell, and Simons 1999).

Treatment

The easiest technique for gaining maximum access to the subscapularis is to sit with the bad arm hanging down between your legs (figure 5.31). Rest your forehead on a table with a folded towel as a pad. This position

relaxes the shoulder muscles and brings the shoulder blade forward and around the body especially if the arm is held loosely down in between the legs. With the palm surface of your fingers firmly against your ribs, push deep into the slot between the ribs and the armpit. If your hand and fingers are tight against your ribs, the fingertips will press right into the subscapularis. Search for exquisitely tender spots deep in the pocket between the ribs and the roll of muscle that defines the back of the armpit. You won't be pinching this roll of muscle or pressing into it; rather seek the deep valley of the armpit itself. For the uppermost trigger points, search very high in the armpit and aim up at the joint itself. When you find a trigger point, treat it with slow, short strokes pressing up toward the ceiling then outwards against the shoulder blade. Travel down the entire length of the muscle. There will be four to five inches, from top to bottom, to search and treat. Don't overlook points near the bottom end of the shoulder blade as you approach its inferior angle.



Figure 5.31 Subscapularis massage with arm hanging down between legs

Try using your thumb for this technique; you may like it better. As you learn forward, place the elbow of your treatment hand on your knee. This will provide better leverage. Periodically, relax the side you are working on, as it will have a tendency to tighten up in defense. Keep your arm down, hanging loosely in between your legs. If you're unsure whether you're touching the subscapularis, contract it by strongly rotating your arm inward. Inward rotation is when your elbow is turned outward. This technique was the primary therapy my father used to treat his own frozen shoulder, as described in chapter 1. Although many other muscles were involved, the subscapularis was the heart of the problem. Give subscapularis trigger points ten to twelve strokes several times a day. If pain wakes you up in the night, have another massage session; it should cut the pain enough to let you get back to sleep. Don't overdo it; the armpit can get quite sore.

Continue daily massage until you can no longer find trigger points. Significant relief can come right away, but complete deactivation may take as long as six weeks. Trigger points that have been in place for months or years will require a great deal of attention. Because they are usually soft, you probably won't be aware of the clusters of lymph nodes here; however, if you feel a firm bump larger than a pinto bean that does not go away in a couple of days, it is wise to have it checked out by a doctor. See the section "Contraindications: Reasons to Be Cautious" in chapter 3 for more details about lymph nodes. You'll quickly discover that long fingernails will keep you from effectively self-treating your subscapularis muscles. Fingernails grow back. Make the sacrifice.

For many people, this self-treatment technique will be either too taxing or simply impossible when obstructed by a broad chest. A gentle, conscientious partner can often be of immense help. Before working on someone else's subscapularis, rehearse the technique on yourself; it will make you more compassionate. If a partner is not a viable option for you, purchase a simple, inexpensive massage tool called the Shemala Fingers from www.bodytools.com. They are a weird little pair of rubber fingers, and the smaller one is invaluable for massaging the subscapularis.

Deltoid

The *deltoid* muscle, if flattened out on a table, would resemble the Greek letter delta, which has the shape of a triangle. On the body, the deltoid muscle completely surrounds the shoulder like a cap. Although the deltoid is technically a single muscle, it has many heads, or sections, that are commonly categorized into three parts: the anterior, posterior, and middle deltoid, on the front, back, and outer side of the shoulder, respectively. Because of this, the deltoid muscle is often spoken of as "the deltoids."

The deltoids attach to the collarbone, scapular spine, and acromion, the bony point of the shoulder. Their lower attachment is to a slight bump about halfway down the outer side of the humerus. In conjunction with the supraspinatus muscle, the function of the deltoids is to raise the arm in any direction—front, back, and sideways.

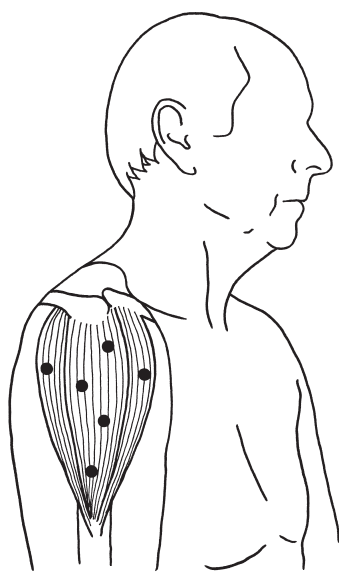


Figure 5.32 Deltoid trigger points

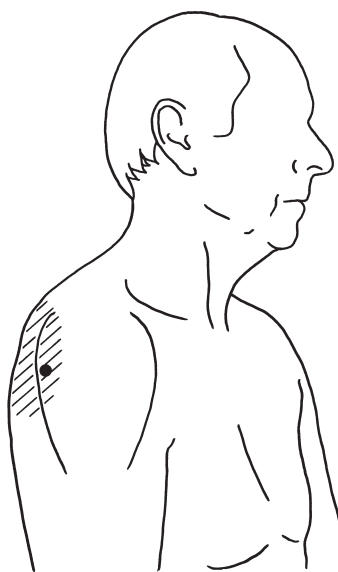


Figure 5.33 Posterior deltoid pain pattern

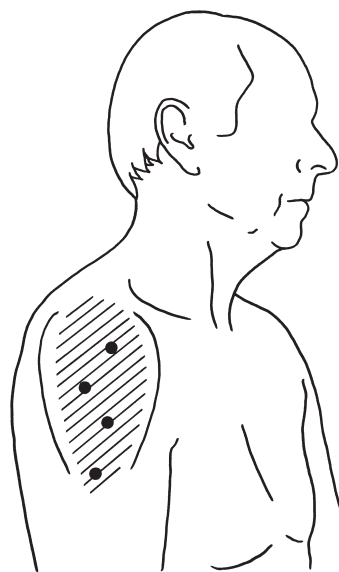


Figure 5.34 Middle deltoid pain pattern

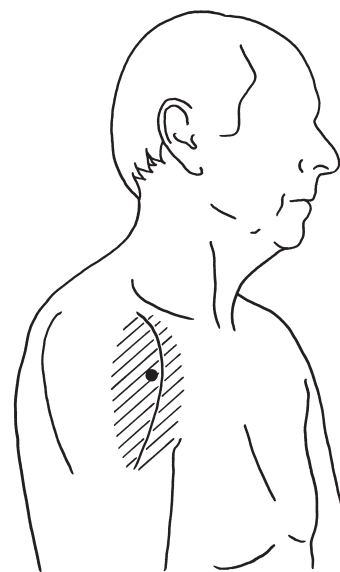


Figure 5.35 Anterior deltoid pain pattern

Symptoms

Pain from deltoid trigger points is unusual in that it is not referred to distant places but is felt at the site of the trigger point or nearby (figures 5.32, 5.33, 5.34, and 5.35). Pain originating in the deltoids is felt mainly when you move the arm and less often when the arm is at rest. In contrast, pain referred to the deltoids from elsewhere is felt continuously or in relation to activity in other muscles. Moving the arm, as when eating or reaching out horizontally, as you do when you reach behind you into the backseat of a car, will make pain in the deltoids (Simons, Travell, and Simons 1999).

Trigger points in any part of the deltoid weaken the shoulder and impair its efforts to raise the arm. Performance in sports or on the job can be seriously degraded. When health care practitioners are unaware of myofascial causes, pain caused by trigger points in the deltoid muscles is apt to be blamed on arthritis, bursitis, or rotator cuff tendinitis (Simons, Travell, and Simons 1999; Reynolds 1981).

Deltoid trigger points are often created as satellites of trigger points in the scalenes, pectoralis major, or rotator cuff muscles, all of which send pain to the deltoid area—the front, back, and side of the shoulder. See this chapter's Pain Guide for the extensive list of muscles that send pain to the deltoid region.

Causes

The deltoids are frequently overloaded in athletic activities that require forceful flexion of the shoulder, particularly swimming, skiing, weight lifting, and ball playing. In the workplace, the deltoid is overused by having to hold heavy tools up to do a job, or by repeatedly reaching up, out, or back, hour after hour. Doing massage professionally or massaging yourself overtaxes the deltoid muscles. Picking up and carrying a baby or small child is a very common way to abuse the deltoids and other shoulder muscles. A shot from a hypodermic needle can set up trigger points as well (Simons, Travell, and Simons 1999; Cailliet 1966; Jonsson and Hagberg 1974).

To reduce repetitive strain to the deltoids, look for ways to change your job that will help keep the elbows down. Typing taxes the deltoids when the keyboard is too high. Good ergonomics dictates keeping the elbows tucked in and the keyboard level with them. Support the elbows whenever possible and try not to sit in chairs that don't have arms.

Keep in mind that the deltoid muscles must work hard to keep the arms from being pulled from their sockets when you carry or lift heavy weights. They also are likely to suffer during any accident or fall that wrenches, jams,

or pulls on the arms. An impact injury to the shoulder can be expected to set up trigger points in the deltoids (Simons, Travell, and Simons 1999).

Treatment

Using your hands to massage the deltoids will needlessly exhaust them. Use a tennis, high bounce, or lacrosse ball against a wall instead. Turning at an angle to the wall will allow you to roll the ball over any of the three parts of the muscle.

Note that trigger points will be found only at midmuscle in the anterior and posterior deltoids. In the middle deltoid, because of its complex fiber arrangement (figure 2.11), trigger points can occur anywhere from the point of the shoulder to the attachment in the middle of the upper arm. Most of the knots will actually be found in the middle deltoid, because it's the largest part of the muscle and works the hardest. Lean into the wall and roll the ball from top to bottom and back again, ironing every inch of the muscle's area.

Upper Arm Muscles

Body builders have an intense appreciation of their upper arm muscles. Everybody else is inclined to forget them. When the upper arm muscles are out of condition, your job or recreational activities can put demands on them that easily exceed their strength and endurance. The upper arm muscles have to support the weight of whatever is in your hand, whether it's a baby, a bag of groceries, or a heavy tool. Sometimes the upper arm muscles are called on to support the weight of the entire body. Simply getting in and out of chairs or in and out of your car can sponsor trigger points in the upper arm muscles, especially if you're carrying a few extra pounds of body weight.

Teres Major and Latissimus Dorsi

The *teres* (TEH-reez) *major* and *latissimus dorsi* (luh-TISS-uh-mus DOR-sye) come together at the back of the armpit and then go around to attach to the front of the upper arm bone near its top (figures 5.36 and 5.37). Their action is to bring the arm down, in toward the chest, and the elbow turned towards the body. With the help of the posterior deltoid, they also extend the arm backward. *Teres major* means “big round muscle.” *Latissimus dorsi* means “wide back muscle.” Although the *latissimus dorsi* is a muscle of the lower back, it's included in this chapter because it moves the upper arm and causes pain in the mid- and upper back.

Trigger points in the *teres major* produce sharp pain in the posterior deltoid (figure 5.36) when you rest your elbows on a table or desk, or reach up and forward to get something from a shelf. When a nearby *latissimus* trigger point is active, this same

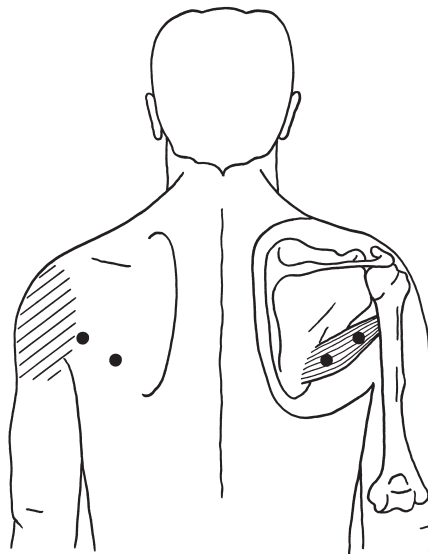


Figure 5.36 Teres major trigger points and referred pain pattern

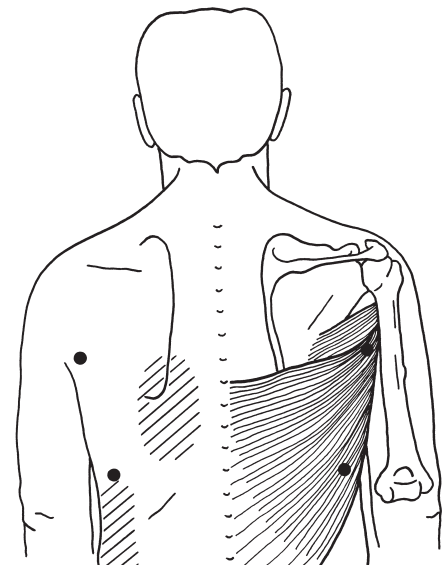


Figure 5.37 Latissimus dorsi trigger points and referred pain pattern

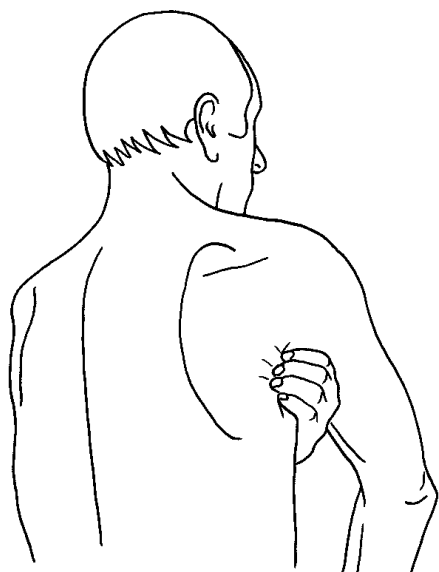


Figure 5.38 Teres major and latissimus dorsi massage between fingers and thumb



Figure 5.39 Latissimus dorsi massage with (lower trigger point) a ball against a wall

motion causes pain in the midback centered on the inferior angle of the shoulder blade (figure 5.37). A trigger point lower in the latissimus dorsi causes pain low on the side of the abdomen. When latissimus trigger points are unusually active, pain may extend to the inner side of the arm all the way down to the ulnar or pinky side of the hand and the fourth and fifth fingers (not shown). Trigger points in either the teres major or latissimus dorsi can also inhibit the full stretch that is necessary to reach up and forward, as when reaching for a high shelf. They keep you from fully lifting your arm. The latissimus dorsi pain can be activated at night and disrupt your

sleep (Simons, Travell, and Simons 1999).

When you consider the importance of the teres major and latissimus dorsi for strongly pulling the arm downward, it's easy to imagine the kinds of strains and overuse that can affect them. For the causes of trouble, look at activities such as gymnastics, tennis, swimming, rowing, chopping wood, pitching, or throwing a ball. Go easy with any exercise that involves pulling yourself up or pushing down with your arms. Be cautious with work that makes you overstretch or repeatedly strain these muscles by reaching forward or overhead. Trigger points in the latissimus dorsi can be perpetuated by a tight bra strap.

Pinching the wad of muscle behind the armpit with the fingers and thumb is very effective for locating teres major and latissimus dorsi trigger points (figure 5.38). Feel for a trough between these two muscles. The latissimus dorsi is more superficial and can be as small as a couple or three fingers' widths. Massage its trigger point with a pinch for best results. A larger grasp will help you locate the teres major. You may feel that all of this tissue is simply fat. Contract these muscles by pulling them strongly back behind you while you pinch. It's surprising how much muscle is located here. The teres major trigger points can be massaged with the Thera Cane or a tennis ball, high bounce ball, or lacrosse ball against a wall. Reaching under your arm, place the ball about halfway down the lateral edge of the shoulder blade and lean into the wall (figure 5.39). Roll the ball onto the shoulder blade at the inferior angle to find the second teres major point. Figure 5.39 shows ball-against-a-wall massage of the lower latissimus dorsi trigger point.

Coracobrachialis

The *coracobrachialis* (COR-ah-co-bray-kee-AH-liss) lies between the biceps and the triceps on the inner side of the upper arm. The muscle is usually a little larger than an index finger and about twice as long. At its lower end, it attaches about halfway down the upper arm bone. At its upper end, it attaches to the coracoid process, the

little piece of the shoulder blade that sticks through to the front of the shoulder (figure 5.16). The action of the coracobrachialis pulls the arm tight against the side.

Pain from coracobrachialis trigger points is felt in the anterior deltoid, triceps, back of the forearm, and back of the hand (figures 5.40 and 5.41). The more active the trigger points are, the more extensive the pain pattern becomes. Under extreme conditions, pain may reach as far as the end of the middle finger. You may not become aware of the involvement of the coracobrachialis in this pattern until more obvious trigger points in the shoulder and upper arm have been deactivated. Trigger points in this muscle can make it difficult to put the arm behind your back or raise it up overhead. A coracobrachialis shortened by trigger points can also squeeze the nerves that supply the arm, causing numbness in the biceps, forearm, and hand (Simons, Travell, and Simons 1999).

Examples of activities that can strain this muscle are push-ups, rock climbing, rope climbing, swimming, throwing a ball, and playing golf and tennis. Any job that requires repeatedly pulling something downward can stress the coracobrachialis. Be careful about lifting heavy weight with the arms stretched out in front and the palms up.

To locate the coracobrachialis, press your thumb against the inner side of the humerus as high up as you can (figure 5.42). Contract the biceps muscle by bending the elbow. Then clamp your elbow tight against your side to contract the coracobrachialis just behind it. It is not the easiest muscle to find, so do this repeatedly if needed. High up the upper arm against the bone is where you will find the trigger points. Massage them with gentle upward and downward strokes of the thumb. Major nerves and blood vessels run behind the coracobrachialis, so take care to stay on the muscle.

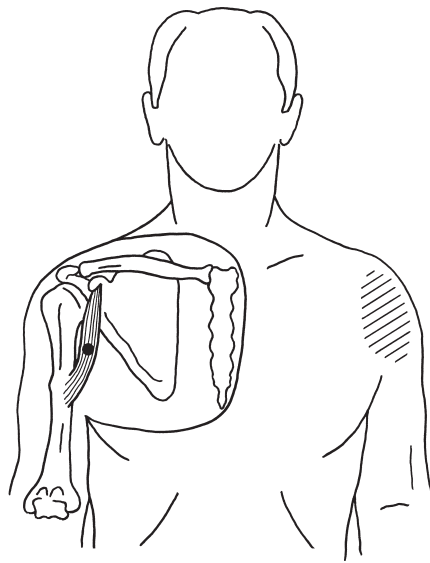


Figure 5.40 Coracobrachialis trigger points and anterior referred pain pattern

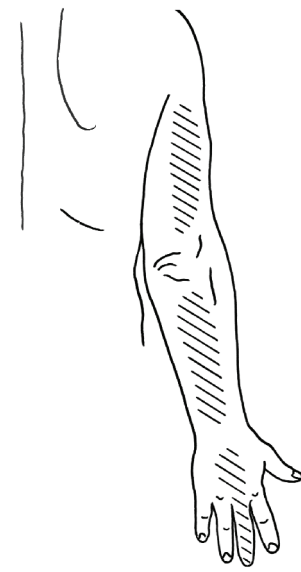


Figure 5.41 Coracobrachialis posterior referred pain pattern



Figure 5.42 Coracobrachialis massage with thumb

Overwhelmed? Make a list of just three muscles that best match your worst symptoms. Treat them all three times a day for a week. At the end of the week add the next three most important muscles.

Biceps

The *biceps* has two heads, one head attaching to the coracoid process, alongside the coracobrachialis, and the other head attaching to the shoulder blade just above the socket (figure 5.43). This attachment to the shoulder blade lets the biceps help raise the arm. The lower end of the biceps attaches to the bones of the forearm, which allows it to bend the elbow and help turn the hand over palm side up.

Another extremely important function of the biceps is to participate in keeping the arm firmly in its socket. Many muscles work to maintain the shoulder joint, but without the biceps it would be impossible to carry any weight at all without pulling the joint apart.

Trigger points in the biceps cause pain or aching primarily in the front of the shoulder itself and in the crease of the elbow (figure 5.43). They cause little pain in the biceps itself. You may also experience weakness in the arm and difficulty in completely straightening the arm with the palm facing down. A vague ache may sometimes be felt in the supraspinatus area behind the shoulder (not shown). Pain referred to the shoulder from the biceps may be mistaken for tendinitis or bursitis (Simons, Travell, and Simons 1999).

Trigger points can be started in the biceps by pain referred to it from

the infraspinatus or subclavius muscles (Simons, Travell, and Simons 1999). Other common causes of trigger points are overexertion in sports activities, lifting heavy weight with the palms up (such as a baby or small child), and performing exercises that strongly flex the elbow, such as pulling up to a chinning bar. Repetitive strain in the workplace—for example, continuously turning a screwdriver—will exhaust the biceps. Repeatedly turning a stiff doorknob may activate pain. Be mindful of any activity that necessitates maintaining a contracted biceps. An example of this is a right-handed person playing the violin, which requires the left biceps to be in maximum contraction to keep the hand in position on the fingerboard. Violinists' right biceps often develop trigger points from the continual contracting and lengthening during bowing. Biceps trigger points can also make the tendon snap or grate over the head of the humerus when taking the arm out to the side.

Trigger points may be found in either head of the biceps at the midpoint of the muscle. Massage the muscle with the supported thumb or rake it deeply with the knuckles (figure 5.44) or with a ball against a wall. Don't get caught up in massaging the tender referral area on the front of the shoulder. Consult this chapter's Pain Guide for all the muscles that refer pain to this area: note that the biceps is low on the list.

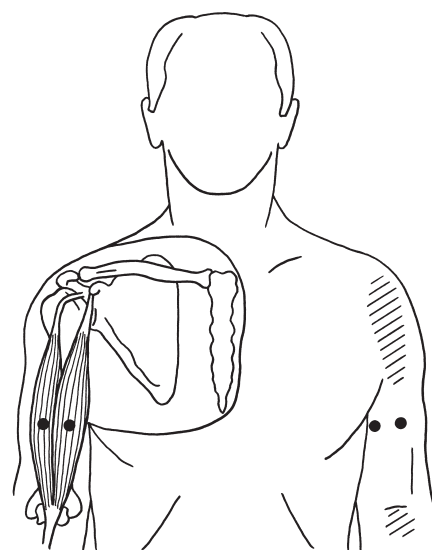


Figure 5.43 Biceps trigger points and referred pain pattern

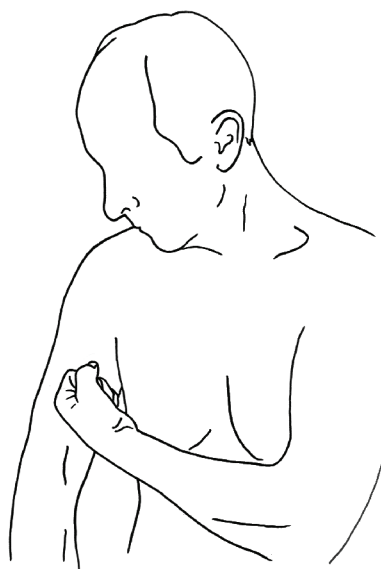


Figure 5.44 Biceps massage with knuckles

Triceps

The *triceps* is a long, broad muscle with three branches, or heads. The attachment of the muscle to the ulna, one of the two bones of the forearm, gives it great leverage for straightening the elbow: the triceps is solely responsible for this function. The attachment of the long head of the triceps to the shoulder blade helps keep the arm in its socket. Triceps trigger points occur at five different sites and evoke five distinct pain patterns.

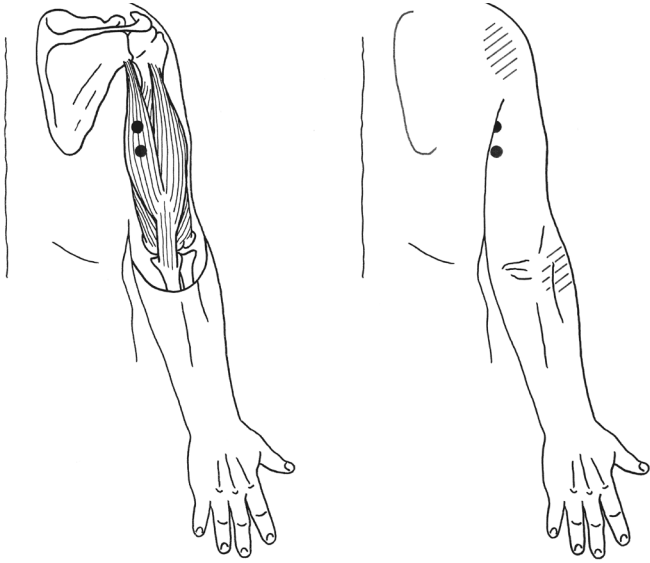


Figure 5.45 Triceps number 1 trigger points and referred pain pattern

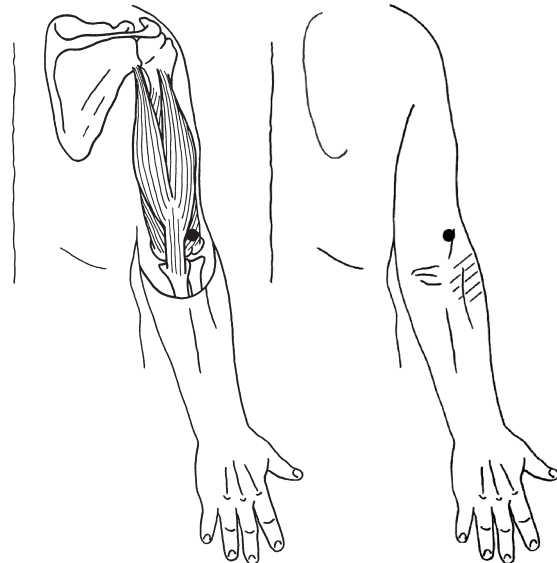


Figure 5.46 Triceps number 2 trigger point and referred pain pattern

Triceps number 1 trigger points send pain to the back of the shoulder and the outer elbow (figure 5.45). When bad enough, they can refer pain into the upper trapezius and the base of the neck (not shown). Although these are the most common triceps trigger points, their location at the inner edge of the triceps makes them easy to miss (Simons, Travell, and Simons 1999).

Triceps number 2 trigger point, being very close to the elbow where the muscle is relatively thin, is also easy to miss. It's one of many sources of the pain in the outer elbow known as “tennis elbow,” or lateral epicondylitis (figure 5.46). Pain may extend some distance down the back of the forearm (Simons, Travell, and Simons 1999).

Triceps number 3 trigger point in the lateral head causes local pain in the back of the upper arm (figure 5.47). It has special importance because it can keep the lateral head tight enough to compress the radial nerve, causing numbness in the thumb side of the forearm and hand (Simons, Travell, and Simons 1999). The radial nerve passes through the muscle at this point. It may feel a little nervy to massage, so go easy.

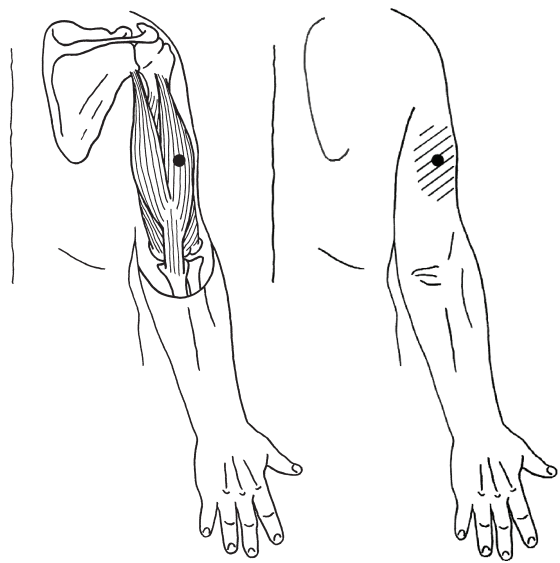


Figure 5.47 Triceps number 3 trigger point and referred pain pattern

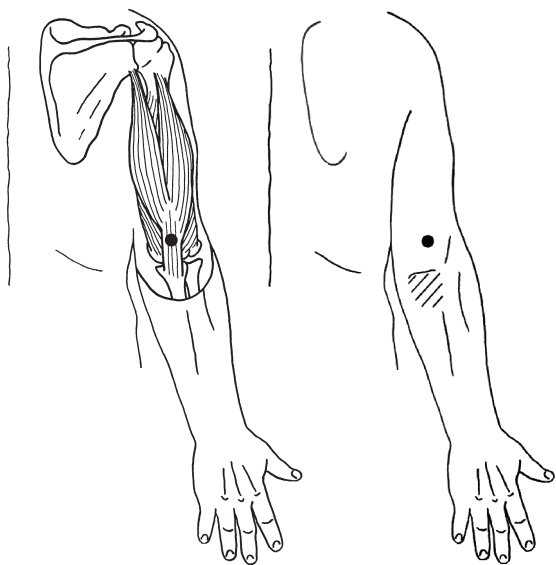


Figure 5.48 Triceps number 4 trigger point and referred pain pattern

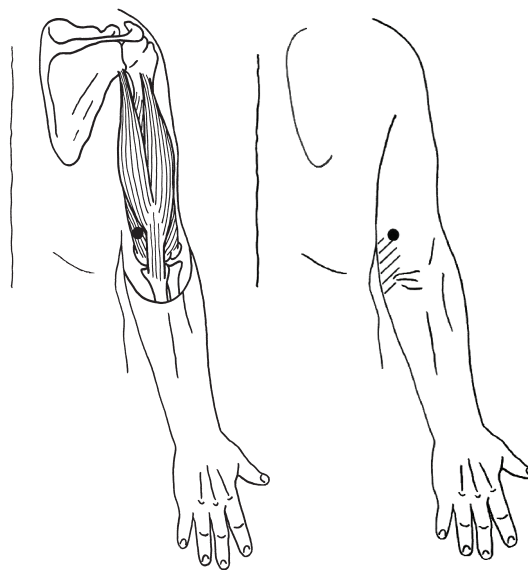


Figure 5.49 Triceps number 5 trigger point and referred pain pattern

Triceps number 4 trigger point makes your elbow hypersensitive to touch (figure 5.48), making it unbearable to rest it on a tabletop or the arm of a chair (Simons, Travell, and Simons 1999). This trigger point is a quick fix when pinched or pressed.

Triceps number 5 trigger point refers pain to the inner elbow and sometimes to the inner forearm (figure 5.49). Pain at this site is sometimes called “golfer’s elbow,” or medial epicondylitis (Simons, Travell, and Simons 1999).

When active enough, some of these trigger points can cause pain in the fourth and fifth fingers. Any of them can also create an oppressive sense of achiness in the back of the forearm and in the triceps itself. Triceps trigger points can be expected to weaken the elbow and limit both its bending and straightening. Arthritis, tendinitis, tendinosis, and bursitis are common explanations for pain referred to the elbow by the triceps when the effects of trigger points haven’t been considered.

Overexertion in sports or the workplace can create trigger points in the triceps, particularly any strong, repetitive pushing action. Simply holding something down for a long, unrelieved period can make the triceps knot up. Sometimes trigger points in the triceps are satellites of unsuspected trigger points in the latissimus dorsi or the serratus posterior superior.

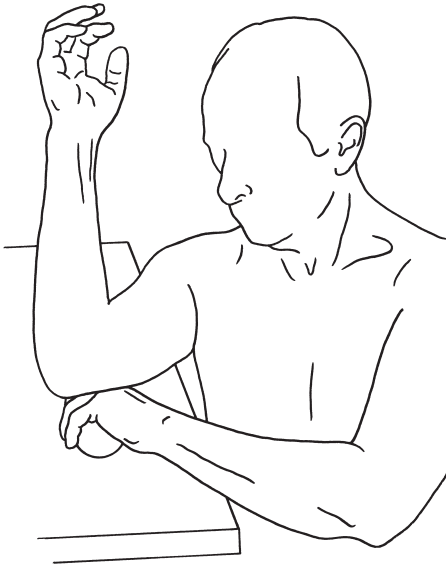


Figure 5.50 Triceps massage with knuckles and ball

A convenient and effective way to massage the triceps is with your knuckles, using a tennis ball to give support to your hand (figure 5.50). This technique works best on a desktop, a tabletop, a filing cabinet, or even the top of an old-fashioned upright piano. You can also use the ball-and-knuckles trick against your chest or on your knee. Another good idea, especially for the outer edge of the triceps, is to use a ball against a wall (figure 5.51).

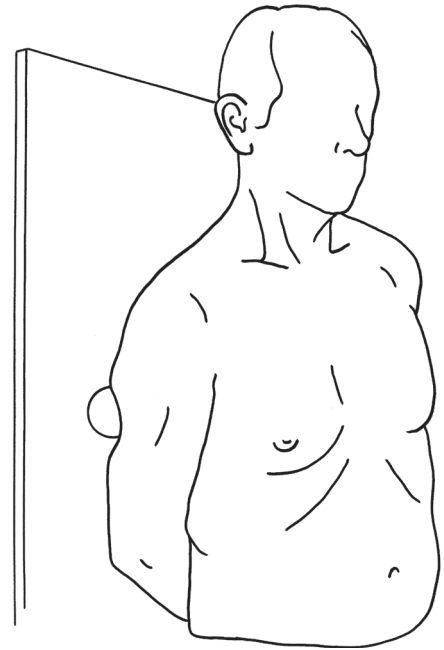
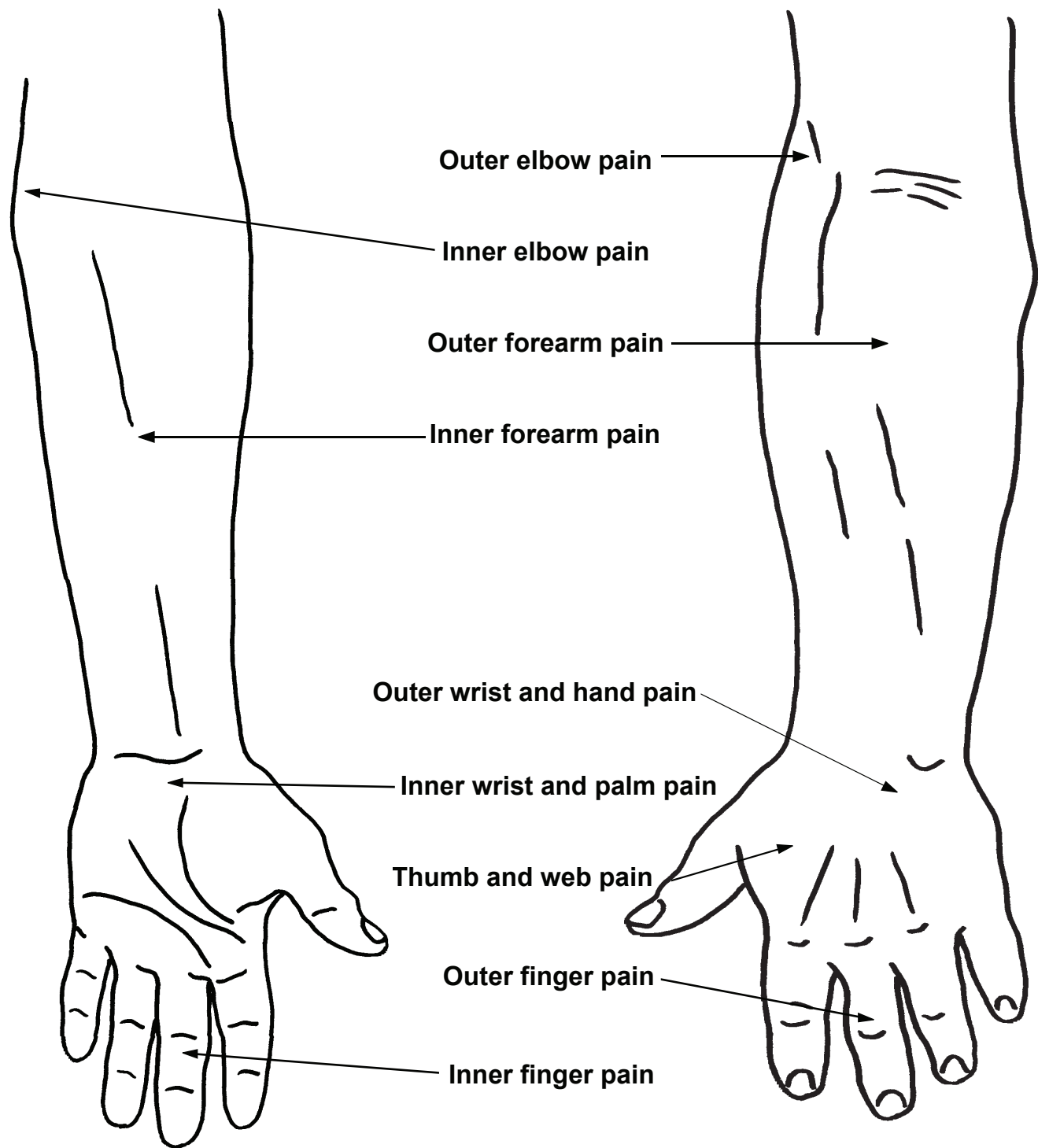


Figure 5.51 Triceps massage with a ball against a wall with hands together and elbow bent

Chapter 6

Elbow, Forearm, and Hand Pain



Pain Guide

Elbow, Forearm, and Hand

Boldface type indicates a primary pain pattern. Regular type refers to a less common or satellite trigger point pattern. Muscles are listed in the order of how likely they are to be the problem. *Also see Other Symptoms Guide.* We've made these guides available for download at www.newharbinger.com/24946. See the back of the book for more information.

Inner Elbow

triceps (121)
pectoralis major (163)
abductor pollicis brevis (150)
 pectoralis minor (167)
 serratus anterior (169)
 serratus posterior superior (105)
 abductor pollicis brevis (150)

Inner Finger (palm side)

flexor digitorum (147)
interosseous (135)
 triceps (121)
 latissimus dorsi (117)
 serratus anterior (169)
abductor digiti minimi manus
 (283)
 pronator quadratus (148)
 subclavius (166)

Inner Forearm

pronator quadratus (148)
 palmaris longus (146)
 pronator teres (148)
 serratus anterior (169)
 triceps (121)
 latissimus dorsi (117)
 pectoralis major (163)
 pectoralis minor (167)
 serratus posterior superior (105)

Inner Wrist and Palm

flexor carpi radialis (145)
flexor carpi ulnaris (145)
opponens pollicis (150)
palmaris longus (146)
pronator teres (148)
pronator quadratus (148)
abductor pollicis brevis (150)
abductor pollicis longus (144)
 pectoralis major (163)
 pectoralis minor (167)
 latissimus dorsi (117)
 serratus anterior (169)

Outer Finger (dorsal side)

extensor digitorum (143)
interosseous (135)
 scalenes (96)
abductor digiti minimi manus
 (283)
abductor pollicis longus (144)
 triceps (121)
 pectoralis minor (167)
 latissimus dorsi (117)
 subclavius (166)

Outer Forearm

brachioradialis (139)
 triceps (121)
 scalenes (96)
 extensors (137)
 infraspinatus (94)
 teres major (117)
 coracobrachialis (130)
 supraspinatus (108)
 subclavius (166)

Outer Elbow

extensors (137)
supinator (139)
brachioradialis (139)
triceps (121)
supraspinatus (108)
anconeus (142)

Outer Wrist and Hand

extensors (137)
abductor pollicis longus (144)
abductor pollicis brevis (150)
 subscapularis (113)
 coracobrachialis (130)
 scalenes (96)
 latissimus dorsi (117)
 serratus posterior superior (105)
first dorsal interosseous (135)

Thumb and Web

supinator (139)
 scalenes (96)
brachialis (130)
 infraspinatus (94)
 extensor carpi radialis longus
 (138)
brachioradialis (139)
abductor pollicis brevis (150)
opponens pollicis (150)
adductor pollicis (151)
 subclavius (166)
 first dorsal interosseous (135)
 flexor pollicis longus (149)

Other Symptoms Guide

Elbow, Forearm, and Hand

Arthritis

extensor digitorum (143)
interosseous (135)

Carpal Tunnel Syndrome

Entrapment of the Median

Nerve in the Forearm

pronator teres (148)
flexor carpi radialis (145)

Pseudo-Carpal Tunnel Syndrome

brachialis (130)
flexor digitorum (147)
scalenes (96)
palmaris longus (146)
opponens pollicis (150)
adductor pollicis (151)
brachioradialis (139)
extensor carpi radialis longus (138)
extensor carpi radialis brevis (138)
subscapularis (113)

Cubital Tunnel Syndrome

Entrapment of the Ulnar

Nerve in the Forearm

flexor carpi ulnaris (145)
flexor digitorum (147)

Entrapment of the Ulnar

Nerve in the Hand

opponens digiti minimi (152)

de Quervain's Stenosing Tenosynovitis

abductor pollicis longus (144)
extensor carpi radialis longus (138)
extensor carpi radialis brevis (138)
brachioradialis (139)
palmaris longus (146)

Difficulty or Pain with Fine Motor Skills

thenar (thumb muscles) (150)
hypothenar (pinky muscles) (152)
interosseous (135)

Finger Stiffness, Tenderness, or Weakness

extensor digitorum (143)
extensor indicis (143)
flexor digitorum (147)
interosseous (135)
hypothenar (152)

Golfer's Elbow (medial epicondylitis)

triceps (121)
pectoralis major (163)
forearm flexors (310)
abductor pollicis brevis (150)

Grip (handshake, doorknob, screwdriver, hand tools)

Undependable

scalenes (96)
extensor carpi radialis longus (138)
extensor digitorum (143)
supinator (139)

Weakness

brachioradialis (139)
extensor carpi radialis longus (138)
extensor carpi radialis brevis (138)
extensor digitorum (143)

Pain

extensor carpi radialis longus (138)
extensor digitorum (143)
supinator (139)
flexor digitorum (147)
flexor carpi radialis (145)
flexor ulnaris (141)
interosseous (135)

Hand Swelling

scalenes (96)

Heberden's Nodes

interosseous (135)
adductor pollicis (151)
abductor digiti minimi (283)

Numbness and Tingling

Forearm

triceps #3 (121)
pectoralis minor (167)
serratus posterior superior (105)

Middle and Ring Fingers (with index or pinky occasionally)

pronator teres (148)
flexor digitorum (147)

Pinky, Ring, and Middle Fingers

scalenes (96)
pectoralis minor (167)
serratus posterior superior (105)
triceps #3 (121)
teres minor (112)
flexor carpi ulnaris (145)
flexor digitorum (147)

Thumb and First Finger

extensor carpi radialis brevis (138)
brachialis (130)
supinator (139)

Radial Nerve Entrapment

triceps #3 (121)
 extensor carpi radialis brevis
 (138)
 supinator (139)
 brachialis (130)

Tenderness**Elbow**

triceps (121)
 brachioradialis (139)
 supinator (139)

Palm (prickling feeling)

palmaris longus (146)

Thumb (and web of hand)

brachialis (130)
 scalenes (96)
 supinator (139)
 brachioradialis (139)
 extensor carpi radialis longus
 (138)

Wrist

flexor carpi radialis (145)
 flexor ulnaris (141)

Tennis Elbow (lateral epicondylitis)

supinator (139)
 brachioradialis (139)
 extensor carpi radialis longus
 (138)
 extensor digitorum (143)
 triceps (121)
 anconeus (142)
 biceps (120)
 brachialis (130)

Thoracic Outlet Syndrome

scalenes (96)
 pectoralis minor (167)
 subclavius (166)

Pseudo–Thoracic Outlet Syndrome

pectoralis major (163)
 latissimus dorsi (117)
 subscapularis (113)
 teres major (117)

Trigger Finger

tendons of the hand and finger
 flexors (137)

Trigger Thumb

flexor pollicis brevis (150)

Weakness (also see Grip)**Arm**

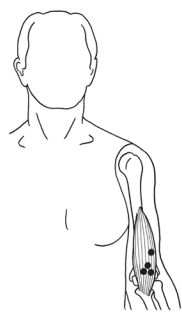
biceps (120)
 scalenes (96)

Hand

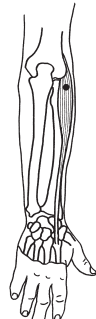
scalenes (96)
 triceps (121)
 extensor carpi radialis brevis
 (138)

Pain Illustrations Guide

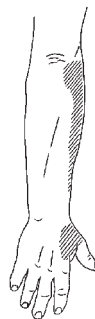
Elbow, Forearm, and Hand



Brachialis trigger points and referred pain pattern. The inner 2 trigger points may cause entrapment of the radial nerve. (p. 136)



Extensor carpi radialis longus trigger point and referred pain pattern. The drawings show the outer side of the forearm and hand. (p. 138)



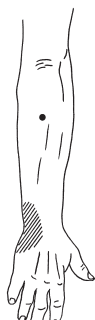
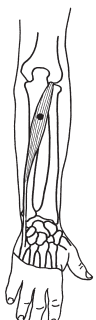
Brachioradialis trigger point and referred pain pattern (p. 139)



Supinator trigger point and referred pain pattern (p. 139)



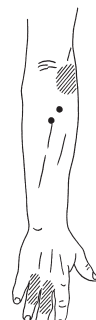
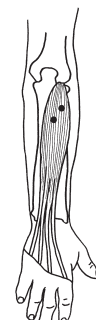
Extensor carpi radialis brevis trigger point and referred pain pattern (p. 140)



Extensor carpi ulnaris trigger point and referred pain pattern (p. 141)



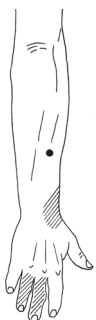
Anconeus trigger point and referred pain pattern (p. 142)



Extensor digitorum trigger points and referred pain pattern (p. 143)



Extensor indicis trigger point and referred pain pattern (p. 143)



Abductor pollicis longus sample trigger point and referred pain pattern (p. 144)

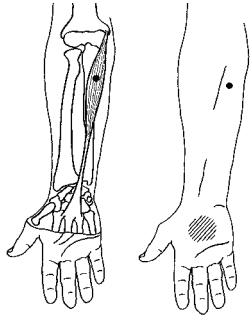


Flexor carpi radialis trigger point and referred pain pattern (p. 145)

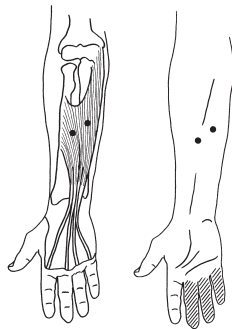


Flexor carpi ulnaris trigger point and referred pain pattern (p. 146)

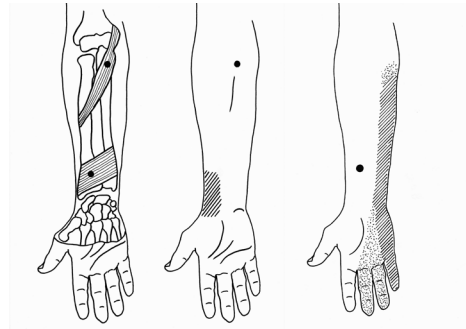
We've made this guide available for download at www.newharbinger.com/24946. See back of book for more details.
Caution: Please read the full treatment instructions for each muscle before beginning.



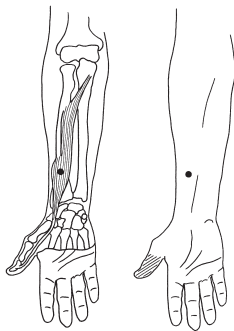
Palmaris longus trigger point and referred pain pattern (p. 147)



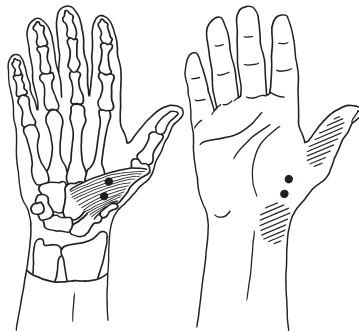
Flexor digitorum trigger points and referred pain pattern (p. 147)



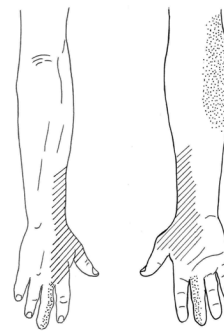
Pronator teres and pronator quadratus trigger points, pronator teres referred pain, and pronator quadratus referred pain (p. 148)



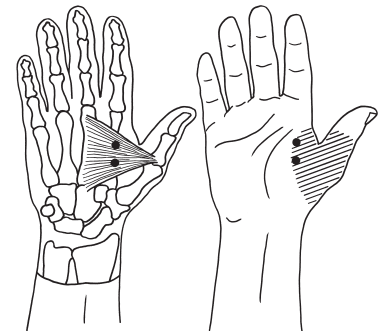
Flexor pollicis longus trigger point and referred pain pattern (p. 149)



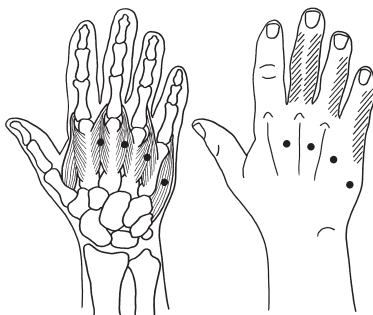
Opponens pollicis trigger points and referred pain pattern (p. 150)



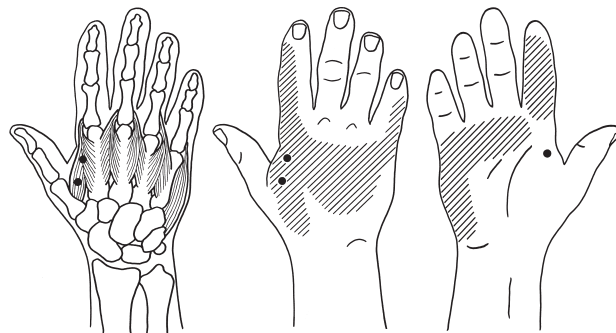
Abductor pollicis brevis referred pain pattern (p. 150)



Adductor pollicis trigger points and referred pain pattern (p. 151)



Dorsal interossei trigger points and referred pain pattern. The abductor digiti minimi manus muscle, trigger point, and referred pain are also included in this drawing. (p. 152)



First dorsal interosseus trigger points and referred pain pattern (p. 152)

Elbow, Forearm, and Hand Pain

Myofascial symptoms in the elbows, forearms, wrists, hands, fingers, and thumbs are extremely common. In addition to pain and aching, trigger points can cause numbness, tingling, burning, swelling, hypersensitivity, weakness, and joint stiffness. The combined effects of several of these things can cause you to unexpectedly drop things.

When the practitioner is uninformed about trigger points, these symptoms are likely to be mistakenly interpreted as indicating epicondylitis, arthritis, bursitis, tendinitis, tendinosis, tennis elbow, carpal tunnel syndrome, de Quervain tenosynovitis, or a neurological defect. Conventional treatment of symptoms in the forearms and hands is usually local, despite the fact that many of these problems originate in the neck, chest, upper back, or shoulders. Because of the displacement of symptoms, relief obtained from local treatments with magnets, wrist splints, pressure straps, electrostimulation, and ultrasound may only be temporary at best. Similarly, since drugs don't affect trigger points and may only mask their symptoms, any beneficial effects of pain medication can only be transitory.

Two popular diagnoses, carpal tunnel syndrome and lateral epicondylitis (tennis elbow), are of particular interest in regard to trigger point therapy. When your symptoms receive one of these labels, conventional treatments may cause needless suffering and expense and give far less than satisfactory results. Even after surgery, cortisone shots, and physical therapy, symptoms can remain unchanged and sometimes worsen. When trigger point therapy is tried first, more extreme measures can often be avoided (Simons, Travell, and Simons 1999).

Carpal Tunnel Syndrome and Thoracic Outlet Syndrome

Libby, age forty, suffered with chronic pain in her shoulders, arms, and hands. In addition, her fingers felt numb, stiff, and swollen. When she went out walking on her lunch hour, the swelling in her hands became so uncomfortable that she often held them up in the air for relief. Her doctor had urgently recommended carpal tunnel surgery to arrest the condition before it got worse. He didn't know whether it would help her shoulder pain but said it was worth a try. She felt like she was in a corner and didn't know what else to do but go through with it.

On the recommendation of a friend, Libby decided to try trigger point therapy before committing to surgery. Massage immediately decreased the pain in her shoulders and arms and the numbness and swelling in her hands. After three massage sessions and some coaching, she was able to continue the massage herself. In six weeks, most of her symptoms were gone. Some of the pain in her forearms and hands tended to come back after working all day at the computer, but she was able to minimize it with the massage techniques she had learned.

Libby determined that, although her job with an insurance company had made all her symptoms worse, her problems actually had started with whiplash she'd suffered in an auto accident three years earlier. Trigger points created in her scalenes by the accident accounted directly for many of her symptoms and had predisposed muscles in her forearms and hands to trigger points of their own.

When confronted with pain, numbness, tingling, stiffness, burning, or swelling in the hands and fingers, the tendency is to identify the condition as carpal tunnel syndrome or peripheral neuropathy and do no further thinking about it. If the treatment for carpal tunnel was noninvasive, quickly improved symptoms, had no side effects, and was cheap, there would be little controversy. However minimal a procedure, there are usually consequences to cutting into human tissue. Doesn't it make more sense to figure out where the problem originates rather than to cut away at the site of the symptom? Trigger points in the scalenes, brachialis, forearms, and hands can mimic all of the symptoms of carpal tunnel. Very often myofascial trigger points are the sole cause of all of these symptoms. Of course, it is also possible for multiple conditions to coexist. With severe symptoms, there may be multiple sites

of impingement coming from multiple muscles of the neck, upper back, chest, arm, and hand. It is important to identify the individual problem and treat it as minimally invasively as possible. Equally as important, if not more so, is the elimination of perpetuating factors that created the problem in the first place (Simons, Travell, and Simons 1999). See “Trigger Point Perpetuators” in chapter 2 for more information.

The *carpal tunnel* is formed in the wrist by the carpal bones and the ligaments and other fibrous tissues that keep them together. The median nerve and several tendons pass through the carpal tunnel on their way to the fingers and hand. The nerve and tendons can be compressed when this passageway is swollen or otherwise restricted.

Although numbness and tingling in the hands, the most easily recognized signs of carpal tunnel syndrome, are clearly the effects of nerve compression, these symptoms may not be coming from the carpal tunnel. The critical impingement frequently occurs in the thoracic outlet, the opening behind your collarbone through which the nerves and blood vessels pass on their way to and from the arm. The impeded return of blood and lymph from the arm is often the cause of the swelling in the wrist and hand that in turn may cause the restriction in the carpal tunnel. When this happens, carpal tunnel surgery may release the constriction in the wrist and relieve the symptoms in the hand to a degree, but it doesn’t treat the real cause. It’s the thoracic outlet that needs attention, not the carpal tunnel (Simons, Travell, and Simons 1999).

The size of the thoracic outlet is reduced when trigger points shorten the scalene muscles in the front of the neck. Tight scalenes pull the first rib up against the collarbone, squeezing the blood vessels and nerves that pass between them. Pressure on these nerves is often the cause of numbness and tingling in the hands and fingers. The pectoralis minor, triceps, brachialis, and certain forearm muscles are also capable of compressing the nerves of the arm and causing numbness in the forearms and hands. When the nerves are being compressed at multiple sites, it can be called *double* or *multiple crush syndrome*. It’s not helpful when a physician labels your problem *peripheral neuropathy*; this term is only a fancy way of saying that something is pressing on a nerve and making your hands or feet numb (Simons, Travell, and Simons 1999).

Use the Other Symptoms Guide at the beginning of this chapter to help track down the likely sources of numbness in your elbows, forearms, and hands as well as the various origins of pain, burning, or other sensations in those areas. For each area that has such symptoms, start at the top of the list and check the listed muscles one at a time for trigger points. Keep in mind that a good rule in troubleshooting your carpal tunnel symptoms is to start with the scalenes. They’re often at the very root of the trouble, setting up a chain of effects all the way down the line. A little attention to your scalenes can make an immediate improvement in many of your shoulder, arm, and hand symptoms. Note that numbness in the hands and fingers can also be caused by trigger points in the serratus posterior superior, serratus anterior, teres minor, pectoralis minor, triceps, coracobrachialis, brachialis, supinator, extensor carpi radialis brevis, flexor carpi ulnaris, flexor digitorum, and pronator teres.

Tennis Elbow (lateral epicondylitis)

The traditional explanation for epicondylitis, or “tennis elbow,” is that you have tendinitis—in other words, that the tendons around your elbow have suffered microscopic tears through injury or overuse. As with any true “itis,” there should be symptoms of inflammation: localized heat, redness, swelling, pain, and sometimes loss of function. A diagnosis of tendinitis is an easy one to make, but it may be the wrong one unless you’ve had an obvious physical injury. The studies on tendinitis show that there is no inflammation present (Khan et al. 2000). Therefore, this condition has been renamed *tendinosis*, or pain at the attachment of a muscle to a bone. If the pain is spot specific, it is likely that the muscle is pulling at the attachment or at the location where muscle becomes tendon. Remember that muscle is the contractile tissue of the unit, not the tendon, yet much of the treatment is focused at the symptomatic tendon. It is better therapy to unload the short, tight muscles that create strain at the attachment site. This includes treating the trigger points and massaging the whole muscle to loosen it up. See “Treating a Strain or Spot-Specific Pain” in chapter 3 for more information. When the pain is deep, achy, and spread over a wide area, it is likely that trigger points are referring pain from elsewhere. In both cases, it is therapeutic to deactivate trigger

points and restore normal resting muscle length. After treating the muscle and the trigger point directly, a protocol of stretching the shortened muscles and strengthening the opposing long and weak muscles may further the therapy and prohibit a recurrence. When stretching and strengthening is done too soon, not only can it delay recovery, it can also worsen the condition. Travell and Simons believed that trigger points in the forearm muscles, not tendinitis, are the most common cause of pain and weakness in the elbow. Other muscles sometimes contribute to the problem, as can be seen in the Pain Guides and Pain Illustrations for this chapter (Simons, Travell, and Simons 1999).

Pain in the inner elbow, which is less common than pain in the outer elbow, is called “golfer’s elbow” (medial epicondylitis), though it probably results less frequently from playing golf than from overexercise or overuse in the workplace. Observe that the list of muscles potentially involved in inner elbow pain is quite different from the list for outer elbow pain. In troubleshooting either condition, remember that two or more muscles may be creating pain at the same place.

Safe Massage of the Forearms and Hands

It’s easier than you might think to get rid of the pain and other symptoms in your forearms and hands. You can make things worse, however, if you don’t use your hands intelligently when applying trigger point massage. You need to give scrupulous attention to *ergonomics*, or the safe, effective use of your hands as tools.

Also, massage of the forearms and hands becomes easier and more efficient when you have a good understanding of the function and location of the individual muscles. It helps to be familiar with the bones of the forearm and hand so that you can make use of their bony landmarks in locating muscles.

Ergonomics

You won’t get much massage done before completely trashing your forearms and hands if you go about it in uninformed ways. You may not realize how tiring it is for the hands and forearms, for instance, to do massage with your thumb working in opposition to the fingers (figure 6.1). The reason for this is that all the muscles in the

forearm participate in the grasping function, and the harder you grip something, the harder they all contract. The forearm muscles, whose function is to operate the hands and fingers, work harder than any other muscles in the body, pound for pound.

Unfortunately, it’s so natural to grasp with the hand that people do it without thinking. It’s best to avoid using your hands at all in massage if you can find any other way. (Note that some muscles, such as the masseters and the sternocleidomastoids, can only be massaged by kneading them between the thumb and fingers: save your hands for them.)

You’ll observe that many massage techniques in this book employ straight fingers or a straight thumb reinforced by the opposite hand. Supported fingers or the supported thumb largely eliminate the use of the forearm muscles (figures 3.2 and 3.3). The fingers or thumb are held as nearly perpendicular to the skin as possible so that the force is applied through their very tips. With this technique, the supported fingers or supported thumb function as the end of a very long prod that has a straight line to the elbow. When this is done correctly, the shoulder muscles and the weight of the body do most of the work, and the muscles of the forearm and hand can remain relatively relaxed.

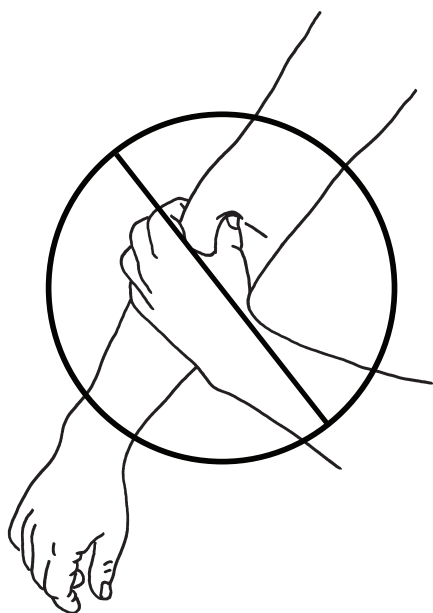


Figure 6.1 Massaging the forearms with a ball is easy and more effective than using your hands.

People who try to do massage with long nails find that their hands tire quickly and that they are unable to do some of the most useful techniques.

A tennis ball, 60 mm high bounce rubber ball, or a lacrosse ball against a wall is the most useful tool for massage of your forearms and hands. Throughout this chapter, I offer nuggets of information about how to most easily use the ball-on-a-wall technique. For some individuals, using the ball on a table or dresser top may be more comfortable or accessible than using the ball on a wall. In this day when most of us overuse computers, video gaming equipment, smartphones, and/or cell phones, it is invaluable to know how to self-treat our arms and hands. Become a connoisseur of small-ball therapy and it will serve you well.

Bony Landmarks

The ability to find and massage specific muscles depends on being able to find nearby bones. The knobby ends of bones, in particular, serve as valuable landmarks. The better you are at locating these landmarks, the better you'll be at locating trigger points.

There are only two bones in the forearm: the *radius* and the *ulna* (UL-nah). Figure 6.2 shows them in the right arm in two different positions. The upper end of the ulna is familiar to you as the point of your elbow. The sharp bony ridge all along the underside of your forearm is the shaft of the ulna. The knob on the little finger or pinky side of your wrist is the ulna's lower end: this is called the *styloid process*. The thick bone in the thumb side of the wrist is the lower end of the radius. When you turn your hand over, the lower end of the radius moves the entire hand around the lower end of the ulna a full 180 degrees. Try this and observe that the ulna itself doesn't turn. With the radius and ulna parallel, the hand is supinated. When the radius crosses the ulna, the hand is pronated. You can remember that *supination* is when the hand is palm up, as if you were to drink soup from your hand. *Pronation* is the opposite, palm down.

The upper end, or head, of the radius is at the elbow. It rotates in its socket when the hand turns over, and this movement can be felt. Feel for two knobs on your outer elbow, about an inch apart. Place a finger on each knob. The closer to the hand is the head of the radius. Feel it turn as you turn your hand over and back several times. Notice that the knob touched by your other finger doesn't move; it's the *lateral epicondyle* (ep-i-KON-dahyl). The bone that sticks out on the inner side of the elbow is the *medial epicondyle*. The epicondyles are parts of the enlarged lower end of the humerus, or upper arm bone.

The eight small wrist bones are called the *carpals* (KAHR-puhls). The carpal bones give the hand mobility, enabling it to move in any direction. Because of this great flexibility, the carpals also serve as shock absorbers, protecting the wrist by spreading stresses over a greater total surface area.

The four bones in the hand and the bone that forms the base of the thumb are called the *metacarpals* (met-uh-KAHR-puhls), "meta" meaning "after": the metacarpals "come after" the carpals. There are small muscles between the metacarpal bones called the *interosseous* (in-tur-OS-ee-uhs) and *lumbrical* (LUHM-bri-kuhl) muscles. Trigger points in these muscles are the source of some kinds of finger and knuckle pain.

The bones of the fingers are called *phalanges* (fuh-LAN-jeez). The thumb has only two phalanges; each finger has three. There are no muscles in the fingers, just lots and lots of tendons, through which the fingers are moved by remote control by the muscles in the forearm and hand.

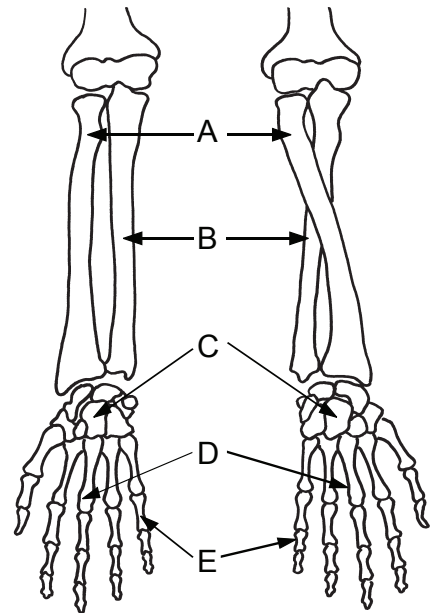


Figure 6.2 Bones of the forearm and hand: (A) radius, (B) ulna, (C) carpals, (D) metacarpals, and (E) phalanges. The hand on the left is palm up (supinated), and the hand on the right is palm down (pronated).

Explore your forearms and hands, feeling for these various bones. Try to visualize how things are arranged under the skin. The better mental picture you have of the bones, the better you'll be at picturing the muscles in there, too.

Brachialis Muscle

The *brachialis* (brah-kee-AH-liss) muscle is the work-horse of the elbow. Lifting by bending the elbow requires contraction of the brachialis. It does much of the work normally credited to the biceps. Although it's an upper arm muscle, the muscle is included in this chapter because the trouble it causes is felt in the hand.

The brachialis lies under the biceps, covering the front of the lower half of the upper arm bone, the humerus (figure 6.3). Its upper end attaches to a bony mound on the outer surface of the humerus about halfway down, just below the attachment of the deltoid muscles. The other end of the brachialis attaches to the ulna bone in the forearm.

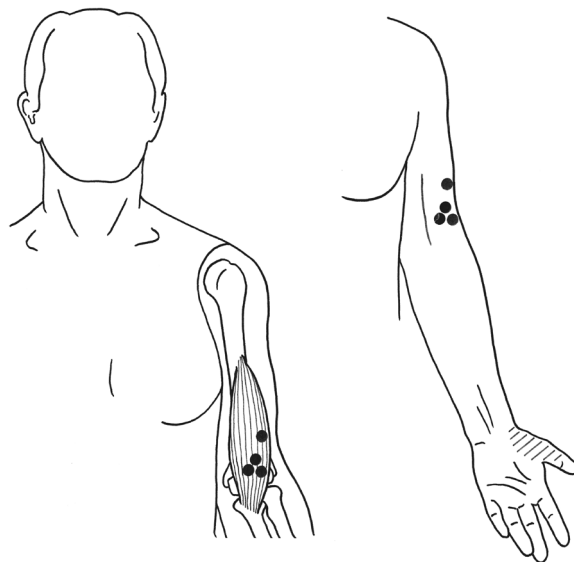


Figure 6.3 Brachialis trigger points and referred pain pattern. The inner two trigger points may cause entrapment of the radial nerve.

Symptoms

Trigger points in a brachialis muscle make it difficult to straighten the elbow. They cause pain and referred tenderness primarily at the base of the thumb and the web between the thumb and the first finger. You may also feel some degree of pain in the front of the shoulder and just below the crease in the elbow (not shown). There may be an oppressive ache or tightness on the outside of the upper arm near the elbow. Compression of the radial nerve that passes through the brachialis can make the thumb and the back of the forearm tingle or feel numb (Simons, Travell, and Simons 1999).

As can be seen in the Pain Guides and Pain Illustrations for this chapter, many muscles are capable of referring pain to the area of the thumb, but it is wise to rule out the brachialis and scalene muscles as the prime suspects. It's natural to massage the thumb when it hurts, but remember that it's a waste of time when the pain is being sent from somewhere else.

Causes

The brachialis can be overworked by carrying heavy bags of groceries, carrying a baby around, picking up growing children, or carrying a purse hanging on the forearm. Brachialis muscles are stressed by holding up heavy tools for long hours and by any repetitive action of the elbow on the job. You can foster trigger points in your brachialis muscles by pulling yourself up too many times to the chinning bar or by any other strained flexion of the elbow in exercise or sports activity. Fingering a violin or guitar can also create problems in this muscle.

Working all day at a computer keyboard with your arms held out in front necessitates continuous contraction of the brachialis muscles of both arms. Using a smartphone or texting with a cell phone can keep the brachialis and brachioradialis short and tight as well as create repetitive stress in many of the muscles that operate the thumb and fingers. Even holding a phone to your ear for long periods of time can stress the muscles that bend the elbow.

Oboe, clarinet, and some saxophone players often suffer from chronic pain and numbness in the thumb of their right hands, which have to continuously support the weight of the instrument. Though the thumb itself may seem to be the trouble because that's where the pain is felt, the real problem is in the brachialis muscle, which has to stay contracted all the time the instrument is being played. In addition to frequent trigger point massage, a wind player should put the instrument down at every opportunity and let the arm hang at the side, allowing the brachialis to lengthen and relax.

Treatment

Brachialis trigger points are found under the outer edge of the biceps, above the crease of the elbow (figure 6.3). Push the biceps aside to access the deeper trigger points, and massage them against the bone with a ball against the wall (figure 6.4). Notice that the arm is held straight down while being braced against the thigh for resistance. The inner two trigger points shown in figure 6.3 may cause entrapment of the radial nerve. It is also possible to treat the middle of the brachialis through the biceps muscle with the ball. You may find it important to also treat the brachioradialis and extensor carpi radialis longus and brevis muscles as well.



Figure 6.4 Brachialis massage with a ball against a wall

Hand and Finger Extensor Muscles

The *extensor* muscles are on the outer, or hairy, side of the forearm. Their upper attachments are to the lateral epicondyle, which is the uppermost bony protuberance on the outer elbow (see “Bony Landmarks” above). They then attach by long tendons to various bones of the hand and fingers. The extensors bend the hand back and straighten or raise the fingers. When you're gripping with the hand, the extensors must contract to keep the finger flexors from bending the wrist inward. (The *flexors* are on the inner, or hairless, side of the forearm.) A strong grip requires strong action in both the flexors and the extensors. The extensor muscles are constantly working in almost everything you do. They're extremely prone to repetitive strain among musicians, who use their fingers intensely for hours on end.

Perry, age twenty-three, a graduate student in the saxophone, experienced excruciating pain in his hands and wrists when he practiced or performed. He'd been working hard preparing for an upcoming recital, but his fingers felt slow and sluggish and his playing was getting worse, not better. After being shown how to massage his forearms, Perry was able to play without pain for the first time in a year. Working on his forearms before and after practicing helped keep the pain from coming back.

Trigger points in the extensor muscles cause pain in the outer elbow and in the back of the forearm, wrist, hand, and fingers. They also cause hand weakness, finger stiffness, and knuckle tenderness. Other effects in the hands and fingers are thumb and first finger numbness, tingling, and discoordination. When your hand and finger extensors are in trouble, you're apt to drop things unexpectedly.

When the extensors have been abused for a long period of time, your first attempts at therapeutic massage can be extremely painful. Just begin with whatever pressure feels good, don't expect too much progress too soon, and keep at it. Success in managing trigger points in the extensors can be one of your most important victories.

Extensor Carpi Radialis Longus, Brachioradialis, and Supinator

The *extensor carpi radialis longus* (ex-TEN-sur CAR-pee ray-dee-AH-liss LONG-gus) attaches to the lateral epicondyle of the humerus and to the base of the metacarpal bone of the index finger (figure 6.5). The muscle and its tendon are aligned along the full length of the radius. Its job is to bend the wrist toward the thumb side of the hand. The wrist action in throwing a Frisbee is a perfect example of this motion. This long extensor of the hand also helps bend the wrist back and participates in bending the elbow. These two actions keep the hand in position for such activities as typing or playing the piano. Without this muscle and the other two hand extensors, your hand would hang limp at the wrist when you hold your arm out in front of you.

Trigger points in the extensor carpi radialis longus are a common cause of tennis elbow. They also send a kind of burning pain to the outer side of the forearm and the back of the wrist and hand. A tight elastic brace is sometimes worn at the elbow to subdue such pain. Pressure from the elastic is believed to interfere with transmission of pain signals. This is a stopgap remedy at best, although it's useful on a job where you simply must keep going. A better therapy is to work on deactivating the trigger points.

The extensor carpi radialis longus muscles are stressed by repetitive activity involving the hands, such as tennis, golf, typing, playing a musical instrument, or stirring cookie dough. When you play the violin, you can get tennis elbow by overworking the extensors in your bowing arm. Orchestra conductors often get pain in their elbows from the continual flexing of the wrist of the baton hand. Diehard Frisbee players get it, too. Any intensive wrist action tends to exhaust all the muscles of the forearm.

In the workplace, study how you might be overusing the extensor carpi radialis longus muscles. Suspect any position that requires their constant contraction to keep the hands in position, such as when you work long hours at the computer keyboard.

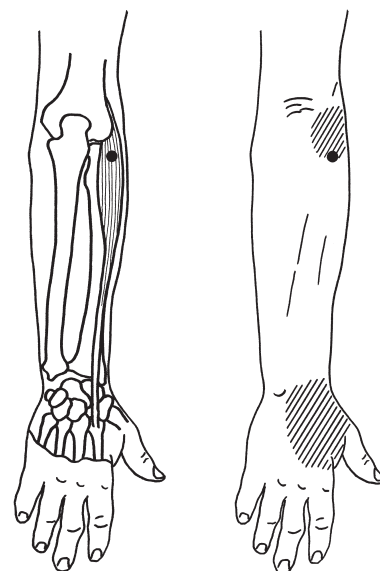


Figure 6.5 Extensor carpi radialis longus trigger point and referred pain pattern. The drawings show the outer side of the forearm and hand.



Figure 6.6 Locating extensor carpi radialis longus by isolated contraction



Figure 6.7 Massage of the three muscles around the head of the radius (extensor carpi radialis longus, supinator, and brachioradialis) using knuckles and loose fist

Extensor carpi radialis longus trigger points are found in the thick roll of muscle on the hairy side of the upper forearm. First, to locate the muscle by isolated contraction, place your fingers on this area, and feel the muscle bulge when you cock your wrist back and toward the thumb side of the wrist as shown in figure 6.6. Then find the trigger point about an inch down and an inch outward



Figure 6.8 Extensor carpi radialis longus massage with a ball against a wall

from the upper crease of the elbow. A tennis, 60 mm high bounce, or lacrosse ball on a wall with the arm oriented straight down may be the easiest way to treat this muscle (figure 6.8). Detailed instructions for treating the extensor carpi radialis longus, brachioradialis, and supinator are listed below. See the protocol for treating a sprain or tear in chapter 3, Treatment Guidelines, if the pain is spot specific at the joint.

There are two other muscles to consider at the head of the radius. They are the *brachioradialis* (brah-kee-oh-ray-dee-AH-liss), which lies alongside the extensor carpi radialis longus (figure 6.9), and the *supinator* (SOO-pih-nay-tur), which lies under both (figure 6.10). Trigger points in these three muscles are relatively close together, and all have similar patterns referring pain and tenderness to the outer elbow and to the web between the thumb and first finger. The brachioradialis helps bend the elbow and can also make a deep, achy pain down the forearm. The brachioradialis can be found by bending the arm at the elbow against resistance. It is the muscle that bulges up just below the elbow on the flexor, or bald side, of the forearm. The trigger point in the brachioradialis is roughly two inches down from the upper crease of the elbow.

The supinator turns the hand palm side up. It is the most common cause of referred pain to the lateral epicondyle either at rest or when carrying heavy objects. Its trigger points can be activated by any forceful supination of the wrist, especially when the elbow is straight. Examples may include executing a tennis stroke poorly, using a screwdriver, or turning a stuck object, such as a doorknob or jar lid. The relentless pull of a dog on a leash can also cause symptoms that usually appear at the elbow. Pain can be caused by the motion of tossing a briefcase onto a desk, shaking hands, erasing a chalkboard, or raking leaves. Under the influence of trigger points, the supinator can squeeze the radial nerve, which may result in numbness in the thumb side of the hand (Simons, Travell, and Simons 1999). To palpate the supinator, move the brachioradialis to the outside, and press deeply against the underlying radius bone. The point is about an inch below the crease of the elbow.

The easiest and most efficient tool to use for forearm massage is a rubber ball about the size of a tennis ball, which is used against a wall. Ideally, the ball would be around 60 mm or 2½ inches in diameter or slightly larger. You may find such a tool in a toy store, pet store, or online. Some people prefer an even harder lacrosse ball. If you can't locate a rubber ball or if using a dense rubber ball feels too aggressive, try this forearm routine with a High Bounce Pinky ball or a tennis ball in a long sock. You will need to control the ball by holding onto the sock right above the tennis ball. It takes a little more effort but is well worth it! The rubber balls are ideal because they grip the wall.

To massage with a ball on the wall, start with your arm hanging straight down and the ball placed just below the elbow on the extensor, or hairy, side of the arm. Find the extensor carpi radialis longus, about an inch below the joint. Turn your thumb slightly toward the wall. Give each of these tender spots ten to

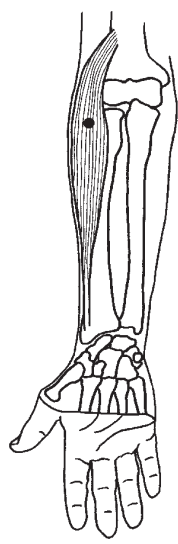


Figure 6.9 Brachioradialis trigger point and referred pain pattern

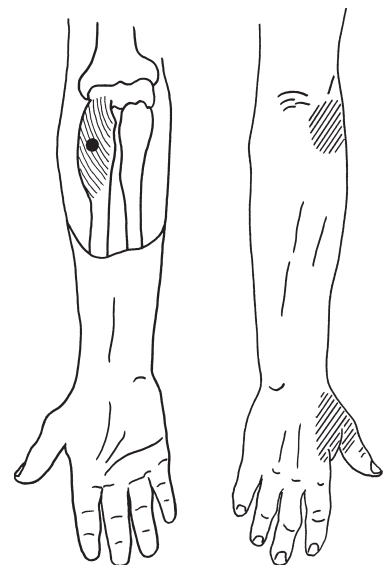


Figure 6.10 Supinator trigger point and referred pain pattern

twelve strokes of massage before moving onto the next. For the next trigger point, face the wall by taking a step toward it. Further supinate your hand so the palm is toward the wall. Roll the ball onto the flexor, or bald, side of the arm. The trigger point in the brachioradialis is roughly two inches down from the upper crease of the elbow. You may also be able to get the supinator deep under the brachioradialis in this position, about an inch below the crease. The same-side hip will be pressing the arm into the wall. This technique isn't comfortable for everyone. If it doesn't feel good to you, try massaging these muscles with a smaller rubber ball held in the palm of your opposite hand. With the elbow resting on the knee, massage any of the forearm points with the ball in your hand. A small 35 mm or 24 mm high bounce ball works the best for this. These are the sizes you might find in a gum-ball machine.

Extensor Carpi Radialis Brevis

The extensor carpi radialis brevis (ex-TEN-sur CAR-pee ray-dee-AH-liss BREH-vis) attaches to the lateral epicondyle and to the base of the metacarpal bone of the middle finger (figure 6.11). Although it's called the "short extensor," it can be a surprisingly big muscle, lying all along the length of the back of the radius.

Trigger points in the extensor carpi radialis brevis send pain to the back of the wrist and hand, and to the outer elbow. A sense of tightness, burning, or aching in the back of the forearm can be coming from this muscle (not shown). Sometimes an extensor carpi radialis brevis staying tight from the influence of trigger points can compress the radial nerve and cause numbness and tingling in the back of the forearm, wrist, and hand. This entrapment can also cause motor weakness of the hand.

Any work or sports activity that requires grasping strongly with the hands and fingers will tire the extensor carpi radialis brevis muscles. At the computer keyboard, the short extensors are among the muscles that have to stay contracted to hold your hands up in position for typing. The wrist rest on your computer key-

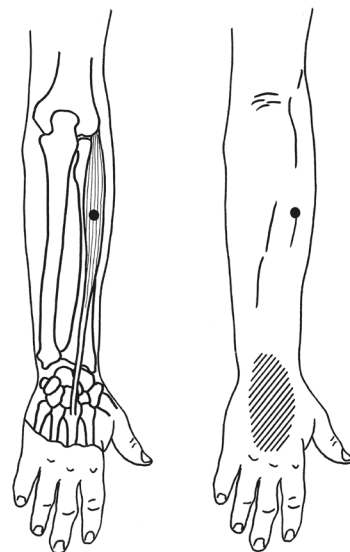


Figure 6.11 Extensor carpi radialis brevis trigger point and referred pain pattern



Figure 6.12 Locating extensor carpi radialis brevis by isolated contraction

board is supposed to take the strain off the extensor muscles, but it doesn't always accomplish what's needed: the wrist rest supports the weight of the forearms but often does little to support the weight of the hands.

Try using the wrist rest in a new way. Between spurts of typing, turn your hands to face one another and rest the sides of your hands on the wrist rest. This little trick gives all the extensors a break and can make a difference in how much pain you have at the end of the day. Make it your automatic rest position, returning to it as often as you can. To improve your posture and help your chest, upper back, arms, and shoulders, train yourself to rest your hands in your lap.

Trigger points are found three or four inches down from the elbow, right against the shaft of the radius. To confirm the location of the short extensor, place your fingers on your forearm, as shown in figure 6.12, and feel the muscle contract when you bend your hand straight back at the wrist. Massage can be done with the supported thumb or even possibly with the opposite elbow, but

a tennis-ball-sized ball against a wall does the best job. The forearm should be at a right angle to the upper arm, with the palm up and the thumb toward the wall (figure 6.13). Lean against your arm and roll the ball slowly and repeatedly over the trigger points. This trigger point often feels like a bruise, so go easy. This deep stroking massage should move along the forearm toward the elbow.

The wrist braces that so many people are wearing now effectively take the strain off extensor muscles that have been disabled by trigger points, but the inactivity they impose tends to let the muscles stiffen. In the end, they can make the problem worse. If you pay proper attention to ergonomics, modify some of your work practices, and learn to self-treat extensor trigger points, wrist braces won't be needed (Simons, Travell, and Simons 1999).

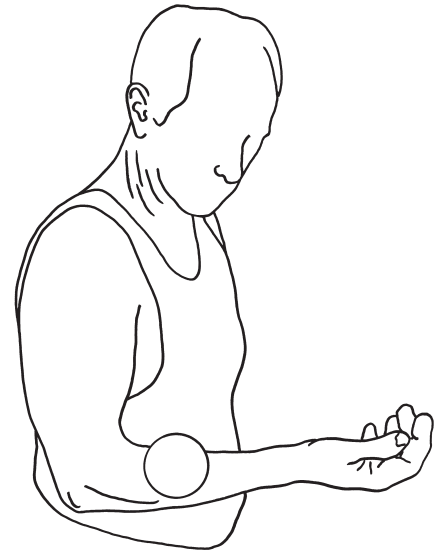


Figure 6.13 Extensor carpi radialis brevis massage with a ball against a wall. Use body weight against the arm to apply pressure.

Extensor Carpi Ulnaris

The *extensor carpi ulnaris* (ex-TEN-sur CAR-pee uhl-NEH-ris) attaches to the lateral epicondyle and to the base of the metacarpal bone of the little finger (figure 6.14). Trigger points in the extensor carpi ulnaris, along with the flexor carpi ulnaris, muscles are the most common cause of pain in the ulnar side (the pinky side) of the wrist and hand. It will feel like you've sprained your wrist.

Note that your wrists are normally cocked toward the ulnar side when you're typing at a standard keyboard or laptop, requiring the ulnar extensors to stay contracted to keep the hands in this position. The ergonomic keyboards with angled rows of keys allow you to keep your wrists straighter and are much easier on the ulnar extensor muscles.

The use of most hand tools necessitates cocking the wrist in an ulnar direction. As a consequence, the ulnar extensors are normally conditioned for hard work and are usually very strong, but any muscle can be overworked. Let ulnar wrist pain be your signal that you need to change the position of your hands to give the ulnar extensors some relief.

Trigger points can be found about two to three inches below the elbow on the outer side of the forearm, alongside the ulna. To find the belly of the muscle, feel it contract when you bend your wrist in the direction of the little finger (figure 6.15). Massage the

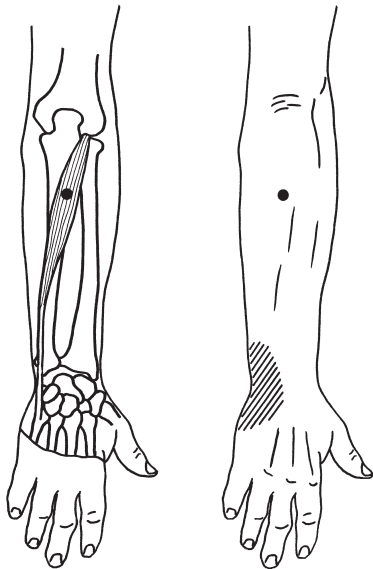


Figure 6.14 Extensor carpi ulnaris trigger point and referred pain pattern



Figure 6.15 Locating extensor carpi ulnaris by isolated contraction



Figure 6.16 Extensor carpi ulnaris massage with a ball against a wall

ulnar extensor with a ball against a wall (figure 6.16). The palm should be facing down, and the thumb side of the hand should be away from the wall. The arm can be either straight down or held horizontally, as shown in the illustration. Use your body weight for pressure, and stroke repeatedly toward the elbow.

You can use isolated contraction to find any muscle in the book. Simply touch the muscle and feel it tighten and move under your fingertips as you do its action.

Anconeus

The *anconeus* (an-CO-nee-us) is a small muscle found right at the elbow, near the extensor carpi ulnaris (figure 6.17). It attaches to the ulna and to the lateral epicondyle and works with the triceps to straighten the elbow. Trigger points in the anconeus refer to the lateral epicondyle and can contribute to the pain of tennis elbow (Simons, Travell, and Simons 1999).

Find the anconeus in the soft area between the point of the elbow and the lateral epicondyle. To confirm the location of the anconeus, place your finger in this area and feel the muscle contract when you pronate your hand strongly (figure 6.18). (Pronation is when you turn your hand over, palm down.)



Figure 6.18 Locating anconeus by isolated contraction

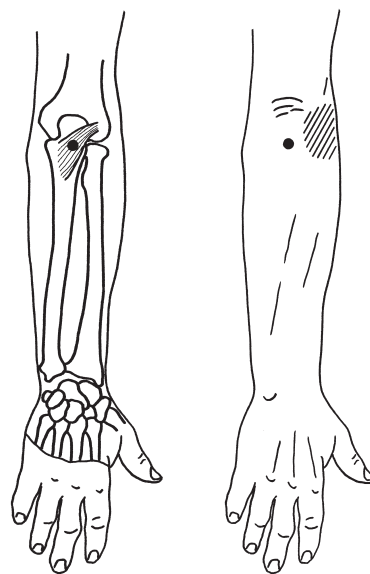


Figure 6.17 Anconeus trigger point and referred pain pattern

Combine the self-treatment of the forearm and hand muscles into one versatile ball-against-the-wall routine. Daily sessions can take a couple of minutes or be extended to 15 to 20 minutes of delicious pain relief.

Extensor Digitorum and Extensor Indicis

The *extensor digitorum* (ex-TEN-sur dih-jih-TAW-rum) attaches to the lateral epicondyle and to the bones of the fingers (figure 6.19). Its job is to straighten or extend the third, fourth, and fifth fingers, which it can do selectively because the muscle has a separate tendon for each finger. Although the index finger also attaches to the extensor digitorum, it is primarily controlled by another muscle, the *extensor indicis* (ex-TEN-sur IN-dih-sis) (figure 6.20).

Trigger points in the extensor digitorum are the prime cause of stiff fingers. They also send pain to the outer elbow (tennis elbow) and the second knuckle of the third and fourth fingers. The referred pain in your knuckles can be mistaken for the pain of arthritis. You may sometimes have an ache in the back of your forearm and a spot of pain on the inner wrist (not shown). Finger tenderness and weakness can also be symptoms of trigger points in the extensor digitorum. Trigger points in the extensor indicis refer pain to the back of the wrist, hand, and index finger (Simons, Travell, and Simons 1999).

When you make a fist or grasp something strongly, the finger extensors are called upon to help keep the wrist from bending when the fingers bend. The harder you grip something, the harder the finger extensors have to work. Activities that call for repetitive gripping or twisting with the hand, such as shaking hands or using a screwdriver, can overwork the extensor digitorum muscle. Repetitive actions of individual fingers can overtire different parts of the muscle.

At a computer keyboard, the extensor digitorum muscles keep the fingers up when they're not actually making keystrokes. With the hands in typing position, the finger extensors stay tight continuously, with little relief. The operation of the mouse creates the same problem with whatever finger presses the buttons. If you're at the computer a lot, trigger points in your extensor digitorum muscles are probably the cause of that oppressive tightness you feel on the backs of your forearms. Give these muscles a break as often as you can by resting your hands on their sides or by putting them in your lap. Make this

your default position when you pause in between thoughts. This may seem a little compulsive at first, but it won't be the least bit inconvenient once you make a habit of it, and it can be a lifesaver for these extremely vulnerable muscles. Don't expect rest to help much, however, until you get ahead of the trigger points.

Locate the extensor digitorum on the outer, or hairy, side of the forearm, two or three inches down from the elbow. You can feel the separate parts of the muscle contract independently when you raise the third, fourth, or fifth finger one at a time (figure 6.21). You can feel the extensor indicis contract

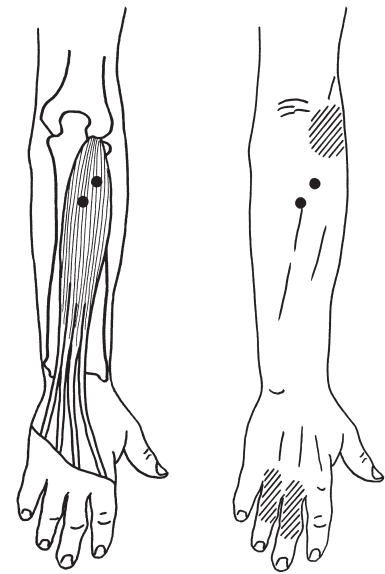


Figure 6.19 Extensor digitorum trigger points and referred pain pattern

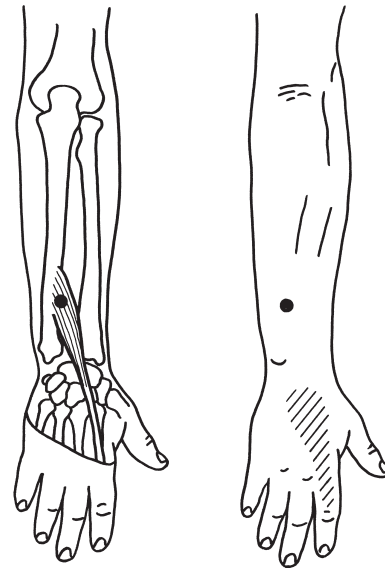


Figure 6.20 Extensor indicis trigger point and referred pain pattern



Figure 6.21 Locating extensor digitorum by isolated contraction



Figure 6.22 Locating extensor indicis by isolated contraction



Figure 6.23 Extensor digitorum massage with a ball against a wall. Roll the ball repeatedly all the way to the elbow.

a couple of inches above the bony knob on the outer side of your wrist when you raise your index finger (figure 6.22).

Massage the extensor digitorum with a ball against a wall, with the back of the hand parallel to the wall and the forearm horizontal (figure 6.23). Roll the ball slowly along the muscle, from the middle of the forearm to the elbow, leaning your body weight into it. To access the extensor indicis, pronate, or turn your hand palm down. The extensor indicis lies between the radius and ulna bones; you may need to use a supported thumb on it.

Remember that multiple sessions throughout the day work best; each session can take as little as a minute or two in length. Stay ahead of pain by having a session before and after the activity that's causing the trouble.

Extensors and Abductor of the Thumb

The thumb is operated by several muscles that originate in the forearm for better leverage. The word “pollicis” means “thumb.” The *abductor pollicis longus* (ab-DUHK-ter POL-i-sus LONG-us) moves the thumb away from the hand, as if opening the mouth of a hand puppet. It also takes the thumb out to the side into what is confusingly called “extension of the thumb.” The *extensor pollicis brevis* (ex-TEN-sur POL-i-sus BREH-vis) does the same two actions and straightens (or extends) the metacarpophalangeal, or middle, joint of the thumb. The *extensor pollicis longus* (ex-TEN-sur POL-i-sus LONG-us) extends all of the joints of the thumb. It acts alone on the last segment of the thumb. All three muscles also contribute to radial deviation, or wrist movement toward the thumb side of the hand. Feel for these muscles to contract on the back of the arm about three to four inches above the wrist when you do their actions. Any activity that overuses the thumb could contribute to trigger points in these muscles, including using a handheld mobile device.

Only referred pain patterns from trigger points have been documented in the abductor pollicis longus. The pattern is very similar to de Quervain tenosynovitis and should be considered in the absence of inflammation or neurological problems. Pain is felt at the thumb side of the wrist and the backs of the third and fourth fingers (Hwang, Kang, Shin, and Hwee 2005) (figure 6.24). Other trigger points may be found in the bellies of the other two muscles. Search and treatment can be done with a 45 mm or 60 mm rubber ball against a wall. A handball is the right size but may be too soft for some users.

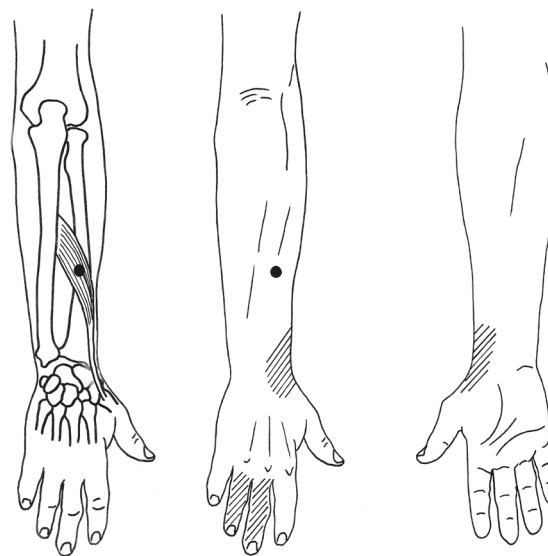


Figure 6.24 Abductor pollicis longus sample trigger point and referred pain pattern

Hand and Finger Flexors

The hand and finger flexors occupy the inner forearm, most of them attaching to the medial epicondyle, the bony projection at the inner elbow. Their job is to bend the hand inward at the wrist, to cup the hand, and to curl the fingers and thumb in toward the palm.

Pain caused by trigger points in the flexor muscles is sent to various locations on the inner side of the forearm, wrist, hand, and fingers. There are three thick layers of muscle on the inner forearm, making trigger points a little harder to isolate and massage than on the back of the forearm.

Massage to the inner forearm can be done with great detail with a small 35 or 45 mm rubber ball on a desktop or dresser top (figure 6.27). You may find either size in a gum-ball machine or toy section of a drugstore. A ball against a wall is also effective, with your back to the wall and both the ball and your arm behind your back. Hold the arm you are treating with the opposite hand for greater leverage while pressing the ball into the wall (figure 6.28). It is difficult to determine which muscle you are on in this position. You can start at the wrist for muscles of the thumb and work your way up to the medial epicondyle, repositioning the ball with the opposite hand as needed. Some folks find facing the wall in a doorway or at convex corner works as well, or better. Hold the arm straight down, palm toward the wall. Use your hip to press the arm into the wall for more pressure.

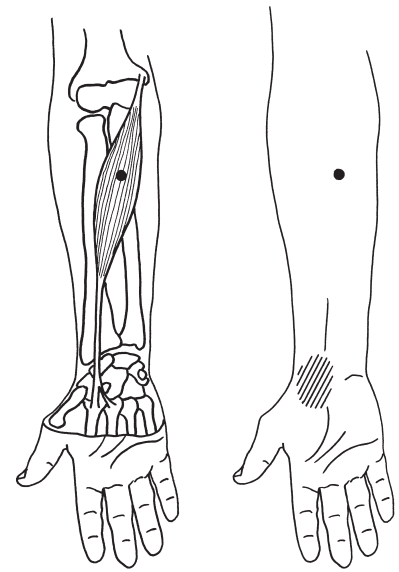


Figure 6.25 Flexor carpi radialis trigger point and referred pain pattern

Flexor Carpi Radialis

The *flexor carpi radialis* (FLEX-ur CAR-pee ray-dee-AH-liss) attaches to the medial epicondyle of the elbow and the metacarpal bone of the index finger (figure 6.25). The flexor carpi radialis works with the flexor carpi ulnaris to bend the hand inward.

Pain from trigger points in the flexor carpi radialis is sent to the inner wrist near the base of the thumb. This pain is commonly mistaken for a wrist sprain. The muscles in the ball of the thumb itself also refer pain to this same spot (Simons, Travell, and Simons 1999).



Figure 6.26 Locating flexor carpi radialis by isolated contraction



Figure 6.27 Flexor side of the forearm with a ball on a tabletop

The hand flexors are abused by excessive use of gripping, twisting, and pulling actions with the hands, including gripping ski poles or small handheld tools. Sleeping with the wrists bent severely inward keeps the flexors in an abnormally shortened state and will tend to set up trigger points in them (Simons, Travell, and Simons 1999).

The flexor carpi radialis runs down the center of the inner forearm. Locate the belly of the muscle about three inches below the elbow. Feel the muscle contract in isolation by bending the hand

inward (figure 6.26). As seen in figure 6.27, a 60 mm or smaller ball can be used against a table or desk for specific massage to any of the flexor-side muscles. Holding the arm behind the back against the wall can give you even more pressure (figure 6.28). Start the ball two or three inches below the elbow and roll it along the forearm all the way to the elbow. Hold the treatment arm with the opposite hand behind your back for good leverage and pressure. In this illustration, the left arm would be getting the massage. The right hand can turn the flesh of the left arm a bit to get it better positioned against the ball on the wall.



Figure 6.28 Position for massaging the flexor side of the forearm with a ball against a wall

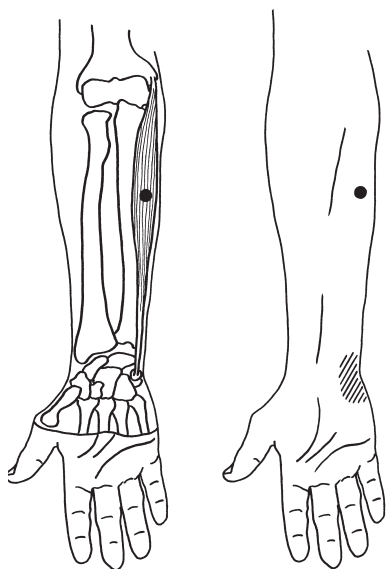


Figure 6.29 Flexor carpi ulnaris trigger point and referred pain pattern

Flexor Carpi Ulnaris

The *flexor carpi ulnaris* (FLEX-ur CAR-pee uhl-NEH-ris) attaches to the medial epicondyle and to a small round bone in the heel of the hand called the *pisiform bone*. This muscle functions to help bend the wrist inward; it also aids the extensor carpi ulnaris in bending the wrist toward the ulnar side (the pinky side).

Flexor carpi ulnaris trigger points send pain to the ulnar side of the wrist (figure 6.29). Note that pain in the ulnar side of the wrist can come from either the flexor carpi ulnaris or the extensor carpi ulnaris, or both. Trigger points here can also make the heel of the hand and inner elbow hurt (not shown). When this muscle is tight, it can compress the ulnar nerve, causing a weakened grip and a sensation of burning or numbness in the fourth and fifth fingers (not shown). This condition is sometimes called *cubital tunnel syndrome*. The flexor digitorum and opponens digiti minimi can also entrap this nerve.

To find the muscle, make it contract in isolation by bending the wrist toward the pinky side of the hand (figure 6.30). Observe that it runs along the inner edge of the shaft of the ulna. For massage, use a supported thumb or a ball against a wall. There may be more than one trigger point, the worst one being roughly halfway between elbow and wrist.



Figure 6.30 Locating flexor carpi ulnaris by isolated contraction

Palmaris Longus

The *palmaris longus* (pahl-MEH-ris LON-gus) attaches to the medial epicondyle and to most of the tendons in the palm of the hand. The function of the palmaris longus is to cup the hand and assist in flexing the wrist.

Trigger points in the palmaris longus cause a burning or prickling sensation in the palm of the hand (figure 6.31). Using tools that exert pressure on the palm can be extremely painful when trigger points are present in the palmaris longus. Pain may also be felt in the lower half of the inner forearm (not shown). Trigger points in this muscle don't cause finger pain but are often associated with

Dupuytren's contracture, a condition that makes the fourth and fifth fingers stay curled into the palm and resist straightening (Simons, Travell, and Simons 1999)

The palmaris longus is a narrow muscle lying between the flexor carpi radialis and the flexor carpi ulnaris on the inner forearm, a little toward the ulnar side. To locate the belly of the muscle, feel it contract in isolation when you bring the tips of your fingers and thumb tightly together (figure 6.32). Trigger points in the palmaris can be found from midarm to the bony projection of the inner elbow (the medial epicondyle). Massage them with the same techniques as with the other flexors.



Figure 6.32 Locating palmaris longus by isolated contraction

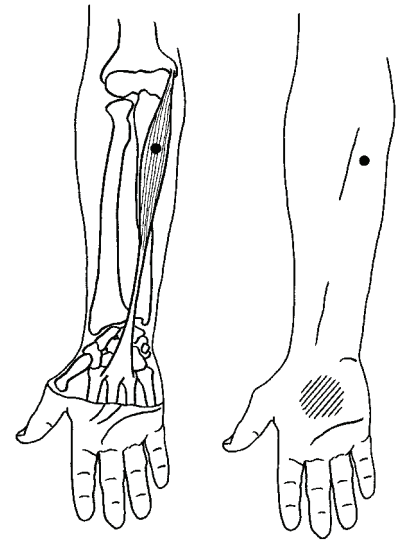


Figure 6.31 Palmaris longus trigger point and referred pain pattern

Flexor Digitorum

There are two parts to the *flexor digitorum* (FLEX-or dih-jih-TAW-rum): the *profundis* and the *superficialis*. One lies over the other and together they make up the second and third layers of muscle in the inner forearm. The lower attachments of the tendons of the flexor digitorum are to the bones of the fingers (figure 6.33). At their upper ends, they attach to both bones of the forearm and to the medial epicondyle.

Trigger points in the flexor digitorum send sharp pain to the inner sides of the fingers. When the flexor digitorum or flexor carpi ulnaris entrap the ulnar nerve, causing pain, numbness, burning, hypersensitivity, and weakness of the hand, it is commonly called *cubital tunnel syndrome*. The median nerve can also be entrapped by the flexor digitorum and pronator teres, causing numbness and tingling in the third and fourth fingers. Uncontrolled twitching of the fingers can be due to trigger points in the flexor digitorum muscles (Simons, Travell, and Simons 1999).

Trouble in the flexor digitorum comes from overuse of the grasping function of the hand with tools and sports equipment, such as tennis rackets, golf clubs, and oars. A long car trip with a hard grip on the steering wheel can put them into a bad state. A job employing the constant use of scissors is bad for these muscles. Hard use of the fingers in playing a musical instrument also promotes trigger points in the flexor digitorum muscles.

The bellies of both layers of the flexor digitorum are difficult to distinguish by contracting them. Search for trigger points in the upper half of the inner forearm; expect them to be deep. Massage with a ball against a wall, previously described, with your arm behind your back, giving broad but deep pressure (figure 6.28).

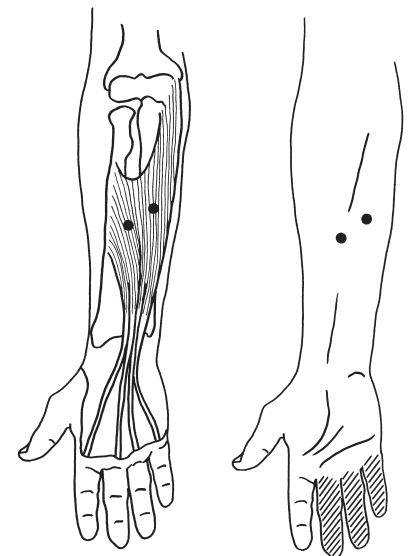


Figure 6.33 Flexor digitorum trigger points and referred pain pattern

The condition known as *trigger finger*, where a finger becomes locked in the flexed position, can sometimes be helped by deep massage to a tender spot on the palm side of the knuckle where the finger joins the hand. Trigger finger can occur in any finger and even in the thumb. It may be due to the flexor tendon becoming stuck within its sheath. According to Travell and Simons, trigger finger can be “promptly and permanently” eliminated by a single procaine injection (Simons, Travell, and Simons 1999).

Pronator Teres and Pronator Quadratus

The *pronator teres* (PRO-nay-tur TEHR-eez) attaches to the top of the ulna and the medial epicondyle and then runs diagonally across the inner forearm to attach about halfway down the radius (figure 6.34). A companion muscle, the *pronator quadratus* (PRO-nay-tur quadRAY-tus), connects the radius to the ulna at the wrist. The action of the pronators rotates the radius around the ulna, bringing the hand into a palm-down position, a movement called *pronation*. The opposite action is *supination*, which turns the palm up. (Supination is accomplished by the supinator and the biceps.)

Trigger points in the pronator teres send pain to a large area on the thumb side of the wrist. Pain may extend into the base of the thumb and up the inner forearm (not shown) (Simons, Travell, and Simons 1999). Pronator teres trigger points can cause the muscle to squeeze the median nerve. The resulting numbness in the third and fourth fingers can be falsely attributed to carpal tunnel syndrome or called *pronator teres syndrome*. The pronator quadratus refers pain both to the hand and up the pinky side of the arm as far as the medial epicondyle. Sometimes the pain will be felt in the pinky finger or the ring and middle fingers together. These patterns mimic the sensory nerve patterns for both ulnar and medial nerves (Hwang, Kang, and Kim 2005).

Any sport or job that requires strong repetitive pronation will overtire the pronator muscles and set up trigger points. In tennis, for example, the hand must pronate strongly when the wrist is used to put topspin on the ball

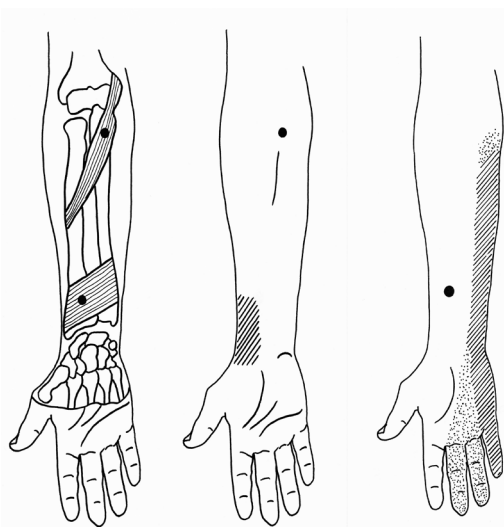


Figure 6.34 Pronator teres and pronator quadratus trigger points, pronator teres referred pain, and pronator quadratus referred pain (avoid deep pressure on the radial artery and median nerve when massaging these muscles)

with the forehand stroke. Loosening screws with a screwdriver in the right hand requires strong action by the pronators. With the screwdriver in the left hand, the pronators are active in tightening screws. Typing at a standard keyboard keeps the hands pronated for long periods of time.

To find the pronator teres muscle, pronate the hand: turn it over hard, palm down, as far as it will go. Locate the muscle by feeling it bulge up as it contracts, just down from the inner elbow (figure 6.35). To find the belly of the pronator quadratus, pronate hard while feeling the place on your wrist where you take your pulse (figure 6.36).

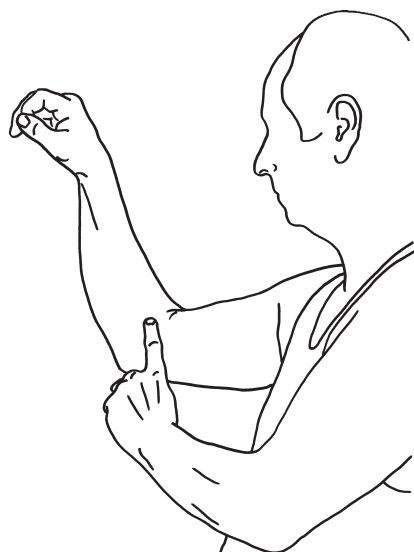


Figure 6.35 Locating pronator teres by isolated contraction



Figure 6.36 Locating pronator quadratus by isolated contraction

The supported thumb works for massaging both muscles. Pronator teres also can be massaged with a ball against a tabletop or a wall with your arm behind you (figures 6.27 and 6.28).

Flexor Pollicis Longus

The word “pollicis” (POL-lih-sis) comes from the Latin for “thumb.” The *flexor pollicis longus* attaches to the last segment of the thumb on the surface opposite the nail (under the thumb pad). The other end of this surprisingly large, strong muscle attaches to most of the length of the radius (figure 6.37). Its action is to bend the last segment of the thumb toward the palm, an important part of a power grip.

Trigger points in the flexor pollicis longus cause pain and tenderness in the last segment of the thumb. They can make your writing grip feel awkward, weak, or clumsy even in the absence of pain. They can cause the last thumb joint to lock or to catch or pop when you bend it (Simons, Travell, and Simons 1999). For many users, this muscle stays contracted continuously while texting or using a mobile phone.

Locate the belly of the flexor pollicis longus, about a third of the way up from the wrist on the radial side (thumb side) of the inner forearm. Feel the muscle contract when you make a hard fist, pressing strongly with your thumb against the middle finger (figure 6.38). Execute massage against the radius with a ball (tennis ball size) against a wall with your arm behind you. Because of the varying length of the fibers in this muscle, there may be several trigger points all along the radius.

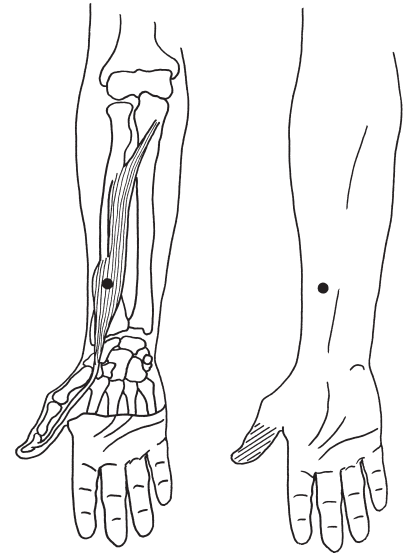


Figure 6.37 Flexor pollicis longus trigger point and referred pain pattern



Figure 6.38 Locating flexor pollicis by isolated contraction

Read Treatment Guidelines in chapter 3. If you feel shy doing the ball against the wall at work, use it against the bathroom stall. No one is going to ask you what you are doing in there.

Muscles of the Hand

When people have pain, numbness, and other symptoms in their hands, only three possible causes generally come to mind: arthritis, tendinitis, and carpal tunnel syndrome. If any of these are your guess, suspend final judgment until you've checked for trigger points. And look first in distant places. When you're troubleshooting hand symptoms, leave the examination of the hands themselves until last. Deactivation of trigger points in your forearms and at sites farther away will very possibly solve the problem. Always use the Guides at the beginning of this chapter to organize your search. After you've excluded referral from other places, symptoms that remain in the hands will be easy to figure out and treatment will be straightforward.

There are nineteen muscles in the hand and many others that originate in the forearm that work to operate the hand. The four largest operate the thumb. Three modest-sized muscles operate the little finger. One muscle cups the palm. Four tiny ones in the palm, the lumbricals, help bend and straighten the fingers. The remaining

seven are the interosseous muscles between the metacarpal bones in the hand. They move the fingers together and apart. Only tendons are found in the fingers themselves.

Thenar Muscles

Three of the four short thumb muscles make up the ball of the thumb, or *thenar* (THEE-nahr). The *flexor pollicis brevis* (FLEX-ur POL-i-sus BREH-vis) and *abductor pollicis brevis* (ab-DUHK-ter POL-i-sus BREH-vis) overlie the *opponens pollicis*, (uh-POH-nuhns POL-i-sus) and the trigger points of all three muscles are very close to one another. The referred pain pattern for the flexor pollicis brevis has not been identified yet, though a trigger point in this muscle is thought to be involved in trigger thumb. All three muscles attach to the thumb bones and to the carpal and metacarpal bones of the hand and wrist (figure 6.39). The opponens and the flexor move the thumb across the palm toward the little finger. The abductor moves the thumb away from the fingers in front of the hand. Imitate using a hand puppet; the abductor is the muscle responsible for opening the mouth of the puppet. The adductor pollicis closes the puppet's mouth. The trigger points for all three are in the meaty part of the hand at the base of the thumb.

Trigger points in the opponens pollicis send pain to the radial side (the thumb side) of the inner wrist, making it feel like you've sprained your wrist. They will also refer pain to the side of the thumb. They make your pincer grip (the grip between your thumb and fingertips) feel awkward. As a consequence, it may be difficult to write with a pen or pencil or do fine manipulations with your hands (Simons, Travell, and Simons 1999). The abductor pollicis brevis can refer pain to the web between the thumb and first finger, as well as down the outside of the middle finger. Pain may be felt in a larger pattern along the lower one-third of the forearm on the radial, or thumb side.



Figure 6.40 Opponens pollicis massage with supported thumb

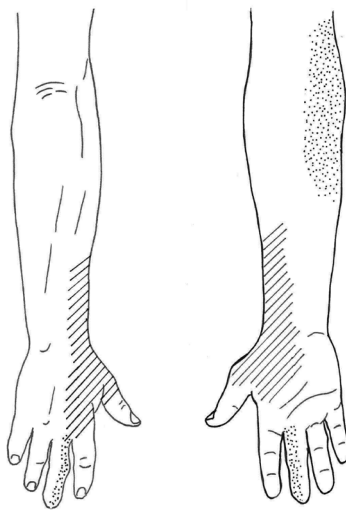


Figure 6.41 Abductor pollicis brevis referred pain pattern

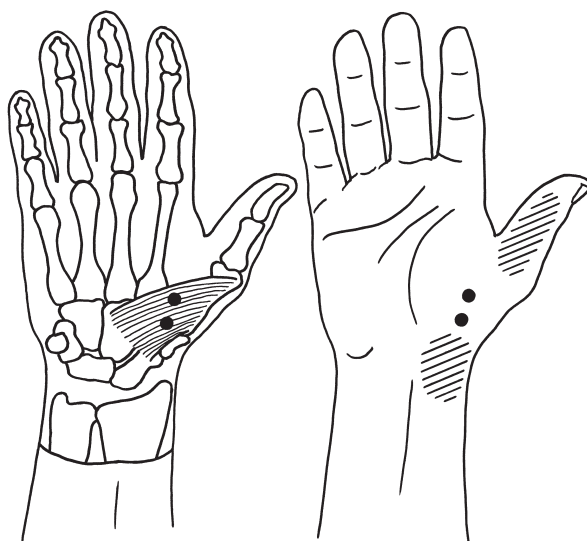


Figure 6.39 Opponens pollicis trigger points and referred pain pattern

Occasionally, the pain can also be felt at the medial epicondyle (figure 6.41). (Kim et al. 2009).

The thumb can be overworked in such mundane activities as weeding the yard, sewing, doing needlepoint, writing with a pen, or playing a musical instrument, and in all craft work and many jobs in industry. Overuse of a mobile phone for texting and typing can create trigger points in any of these muscles. Many massage therapists have to quit the profession and seek another way to make a living because of thumbs crippled by overuse.



Figure 6.42 Position for massage of hands against a wall with a 24 mm or 35 mm high bounce ball

Search for trigger points all over the fleshy base of the thumb; there is usually more than one. The safest and most efficient way to massage the ball of the thumb may be to roll it back and forth over a small, hard rubber ball on the top of a table or with the ball against a wall behind you. The easiest position against a wall is shown in figure 6.42. Use a 24 mm or 35 mm high bounce ball. They can be easily found in gumball machines. The 24 mm ball is slightly larger than a US nickel. The 35 mm ball is about the size of a US quarter. The eraser end of a pencil is also a useful tool (figure 6.49). In an emergency, you can massage this area with a supported thumb (figure 6.40).

The hardest part of this therapy is getting yourself to do it. Every time you do your self-treatment, pat yourself on the back.

Adductor Pollicis

The *adductor pollicis* (uh-DUK-tur POL-lih-sis) is the fourth short thumb muscle. It makes up part of the web (the fan of flesh between your thumb and the side of your hand) and attaches to the first and third metacarpal bones (figure 6.43). Its job is to move the thumb toward the hand either from the side L-shaped position (with the thumb out to the side) or from the front (as when using a hand puppet). To verify its location, place a finger of the opposite hand on the adductor pollicis. You should feel the muscle contract when you squeeze the thumb against the base of the index finger. This will give you an idea of how it participates in the grasping function of the thumb.

Trigger points in the adductor pollicis refer pain to the base of the thumb; they refer very little pain to the web. Keep in mind that pain can also be referred to both the web and the base of the thumb by the scalenes, brachialis, extensor carpi radialis longus, supinator, brachioradialis, and abductor pollicis brevis (Simons, Travell, and Simons 1999).

Adductor pollicis trigger points can be worked by pinching the web. A less tiring massage technique employs a small rubber ball against a tabletop or behind your back against a wall.

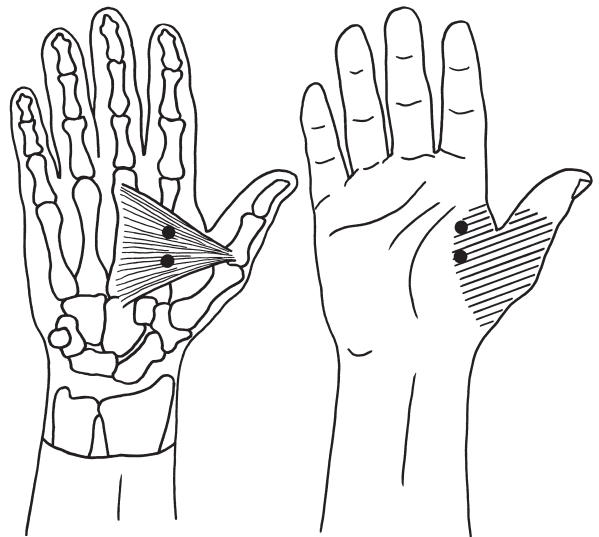


Figure 6.43 Adductor pollicis trigger points and referred pain pattern

On a pain scale of 1-10, a “5” should be your perfect level of pressure. It should feel “therapeutically delicious,” a little bit painful, but you like it. At a “6” you will start to squint your eyes.

Hypothenar Muscles

There are three modest muscles that operate the smallest finger in the hypothenar area, or pinky side of the hand. They are the *abductor digiti minimi manus* (ab-DUHK-ter DIH-jih-tee MIH-nih-me MEY-nuhs,) *flexor digiti minimi manus* (FLEX-ur DIH-jih-tee MIH-nih-me MEY-nuhs), and *opponens digiti minimi* (uh-POH-nuhns DIH-jih-tee MIH-nih-me). The abductor takes the little finger to the outside, away from the hand. The flexor bends the whole finger down toward the wrist. The opponens acts to bring the little finger across the palm to meet the thumb. The referred pain patterns of these muscles have not been established yet, but you will find tender little points in all of them that feel great to massage. Use a 24 mm or 35 mm rubber ball on a desktop or behind your back against a wall to massage these muscles (figure 6.42). Turn your hand to get the outer edge of the hand against the ball. Support your hand at the wrist with your opposite hand.

Keep in mind that pain can be sent to the fourth and fifth fingers by many muscles, including the serratus posterior superior, serratus anterior, latissimus dorsi, pectoralis major and minor, extensor carpi ulnaris, flexor carpi ulnaris, and triceps. Numbness in these two fingers and in the ulnar side of the hand comes from the flexor carpi ulnaris, flexor digitorum, pectoralis minor, triceps, teres minor, and scalenes (Simons, Travell, and Simons 1999).

Interosseous Muscles

The *interosseous* (in-tur-AW-see-us) muscles fill the space between the four metacarpal bones in the hand (figure 6.44). Note that these small muscles occupy only the half of the hand nearest the fingers. The heel of the hand is filled with carpal bones. There are two sets of interosseous muscles. The four *dorsal interosseous* are accessible from the back of the hand. They move the index and fourth fingers away from the middle finger and move the middle finger from side to side. The three *palmar interosseous* muscles are accessible through the palm. They bring the fingers together by moving the index, fourth, and fifth fingers toward the middle finger. All seven interosseous muscles have a role in the grasping function and in the many subtle manipulations of the fingers and hand.

Trigger points in the interosseous muscles refer pain to the sides and undersides of the fingers and the last finger joints. They contribute to finger stiffness, weakness, and awkwardness. Interosseous muscles can cause numbness in the fingers when they compress the digital nerves, which also lie between the metacarpal bones. The digital nerves are sensory nerves for the fingers (Simons, Travell, and Simons 1999).

The bulky, highly developed first dorsal interosseous muscle makes up most of the web between the index finger and thumb (figure 6.45). Its trigger points have a much wider referral pattern, sending pain to the palm, the

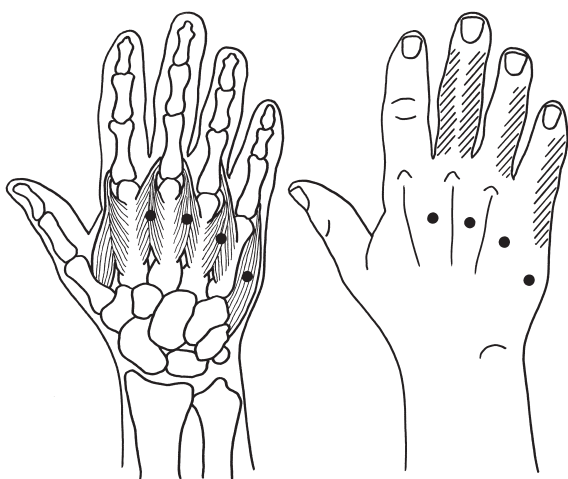


Figure 6.44 Dorsal interosseous trigger points and referred pain pattern. The abductor digiti minimi manus muscle, trigger point, and referred pain are also included in this drawing.

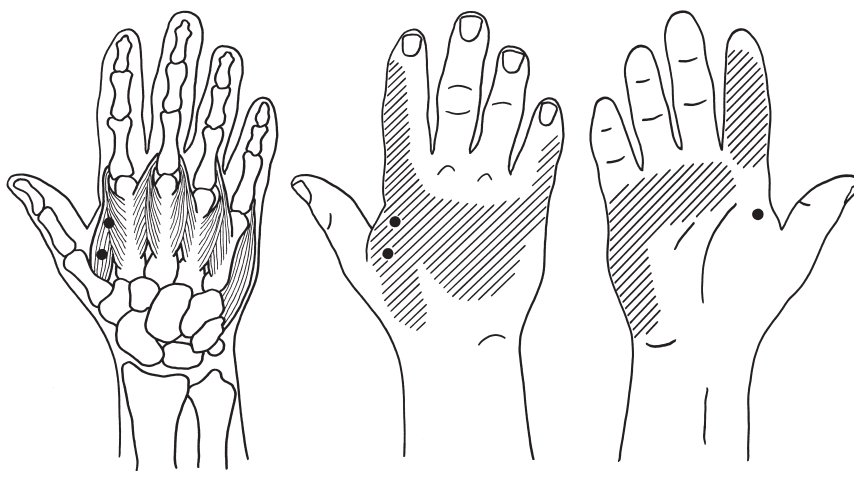


Figure 6.45 First dorsal interosseous trigger points and referred pain pattern

little finger, the back of the hand, and all surfaces of the index finger. They frequently refer a deep ache to the entire ulnar (pinky side) side of the hand. To locate the first dorsal interosseous muscle, see and feel it bulge up as you press the index finger against the thumb (figure 6.46).

If writing with a pen or pencil gives you pain in the underside of your middle finger and its last knuckle, look for a trigger point in the second dorsal interosseous muscle, between the metacarpals of the index and middle fingers. This muscle helps the middle finger push against the thumb to grip the pen between them. Fixing writer's cramp is often only a matter of finding the hand muscles that have the trigger points. The short thumb muscles and the first dorsal interosseous are the usual source of writer's cramp, but don't overlook the others.

Heberden's nodes, bumps on the sides of the last knuckles, are thought to originate with trigger points in overused interosseous muscles. Bumps on the middle knuckles are called *Bouchard's nodes*. It may be possible to eliminate both kinds of nodes by trigger point therapy to the interosseous muscles if intervention comes early enough. Even if fully developed, nodes can often be reduced. The same stresses in the interosseous muscles that create nodes on the knuckles may contribute to the development of arthritis (Simons, Travell, and Simons 1999).

Players of musical instruments like the piano, violin, or guitar, who must often spread their fingers to extreme positions to reach notes, are especially prone to overuse of the interosseous muscles. Repetitive, powerful gripping with the fingers on the job or in a sports activity also risks overloading these small muscles.

Your computer mouse puts both the first dorsal and first palmar interosseous muscles at risk of overuse if you use your index finger to click the buttons. The mouse also predictably overworks the extensor indicis and part of the extensor digitorum, which work together to lift the finger between down strokes. If you position your mouse far to the side of your keyboard, you're likely to create trigger points in your infraspinatus, teres minor, trapezius, rhomboid, and anterior deltoid muscles because of the continuous outward rotation and forward flexion of the arm. A good solution to the mouse problem may be an ergonomic keyboard with a built-in touchpad mouse.

The tip of a supported thumb can be used to massage the interosseous muscles (figure 6.47). Deeper massage can be done with a wedge-shaped rubber eraser, held in a small spring clamp to save your fingers. Figures 6.48 and 6.49 show two different kinds of erasers that can be found everywhere. One is a big pink eraser; the other fits over the end of a shortened pencil, which is then gripped in the clamp. The inexpensive plastic spring clamp shown in the illustrations can be found at many variety, department, and hardware stores.



Figure 6.46 Locating first dorsal interosseous by isolated contraction



Figure 6.47 Dorsal interosseous massage with supported thumb

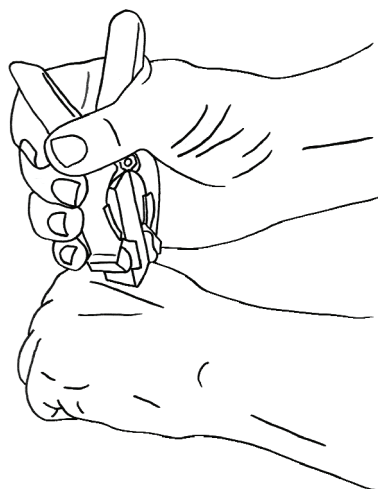


Figure 6.48 Eraser massage of interosseous

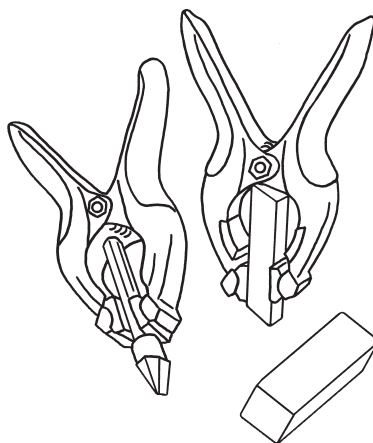


Figure 6.49 Spring clamps and erasers for massage of interosseous muscles

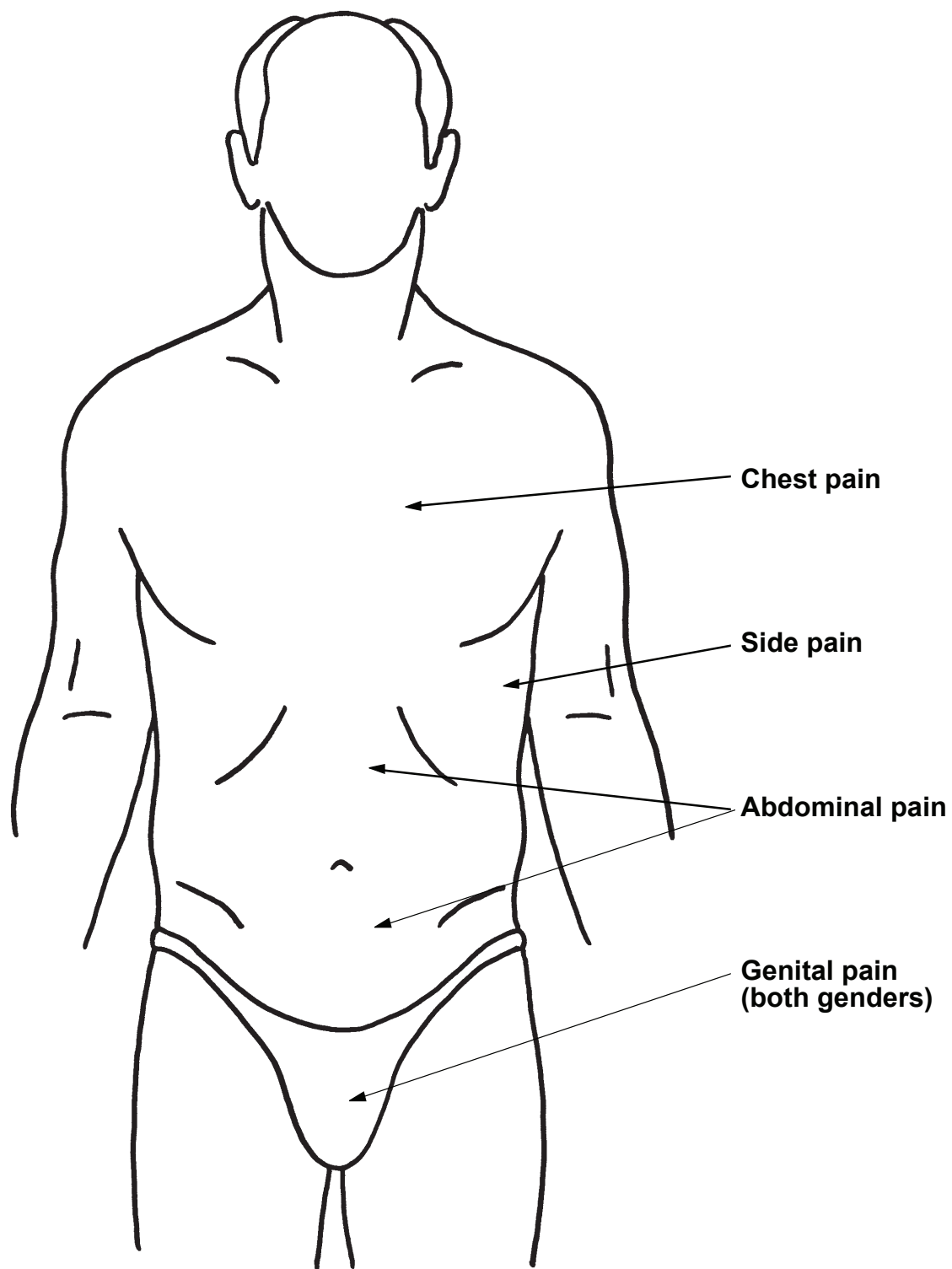


Figure 6.50 First dorsal interosseous massage with supported thumb. Press the muscle against the bone.

Massage the thick first dorsal interosseous by pressing it against the metacarpal bone with supported thumb (figure 6.50). The hand will be held in a neutral position, as if holding a cup. It works well to have your hand resting in your lap while massaging with an eraser or supported thumb. Be slow and detailed in your search for trigger points; there can be several in this muscle. Trouble with the interosseous muscles can be difficult to resolve. They're not easy to massage and your activities may be keeping them under continuous stress. Give serious thought to changes you can make in the way you use your hands that will give these special muscles a break.

Chapter 7

Chest, Abdominal, and Genital Pain



Pain Guide

Chest, Abdominal, and Genital

Boldface type indicates a primary pain pattern. Regular type refers to a less common or satellite trigger point pattern. Muscles are listed in the order of how likely they are to be the problem. *Also see Other Symptoms Guide.* We've made these guides available for download at www.newharbinger.com/24946. See the back of the book for more information.

Abdominal

rectus abdominis (172)
 abdominal obliques (172)
 iliocostalis (195)
 deep spinal muscles (192)
 quadratus lumborum (198)

Chest

pectoralis major (163)
 pectoralis minor (167)
 scalenes (96)
 sternocleidomastoid (62)
 sternalis (166)
 intercostals (195)
 iliocostalis (195)
 subclavius (166)
 abdominal obliques (172)
 diaphragm (171)

Genital

pelvic floor muscles (181)
 abdominal obliques (172)
 adductor magnus (236)
 rectus abdominis (172)
 gluteus maximus (201)
 piriformis (182)
 psoas (177)

Side

serratus anterior (169)
 abdominal obliques (172)
 intercostals (195)
 latissimus dorsi (117)
 diaphragm (171)

Other Symptoms Guide

Chest, Abdominal, and Genital

Belching

abdominal obliques (172)

Bladder Pain or Frequency

adductor magnus (236)
abdominal obliques (172)
piriformis (and other deep lateral rotators) (209)
pelvic floor (162)

Breast or Nipple Hypersensitivity

pectoralis major (163)
serratus anterior (169)

Cardiac Arrhythmia

pectoralis major (163)

Cardiac Ischemia or Angina (false)

pectoralis major (163)
pectoralis minor (167)
sternalis (166)
superficial spinal (195)
iliocostalis (195)

Chronic Pelvic Pain, Gynecological or Menstrual Pain

abdominal obliques (172)
rectus abdominis (172)
adductor magnus (236)
pelvic floor (162)
piriformis/deep rotators (209)
psoas/iliacus (177)

Coccyx (tailbone) Pain or Tenderness

gluteus maximus (201)
multifidi (78)
pelvic floor (levator ani, coccygeus, sphincter ani, and obturator internus) (162)

Colic

rectus abdominis (172)

Costochondritis

pectoralis major (163)
serratus anterior (169)
intercostal (171)
diaphragm (171)
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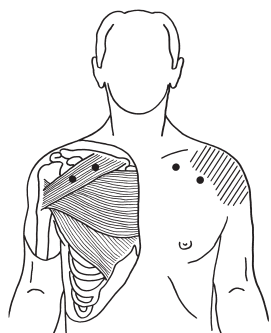
abdominal obliques (172)
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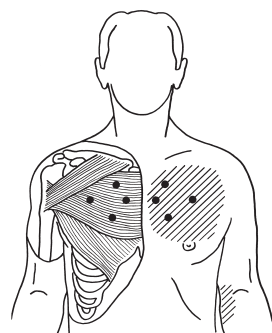
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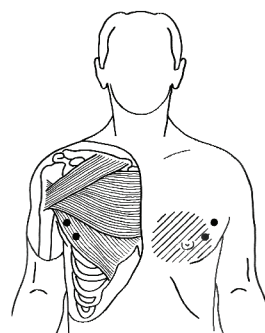
Chest, Abdominal, and Genital



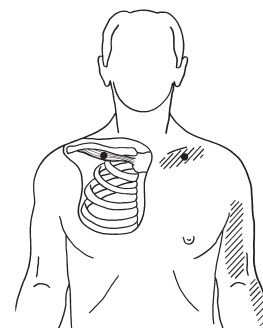
Pectoralis major, clavicular section: trigger points and referred pain pattern (p. 163)



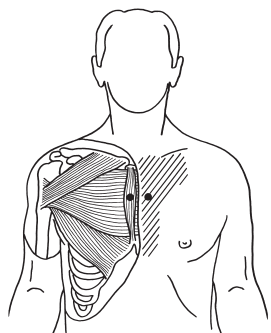
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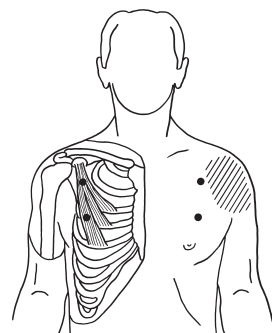
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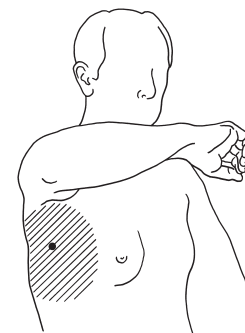
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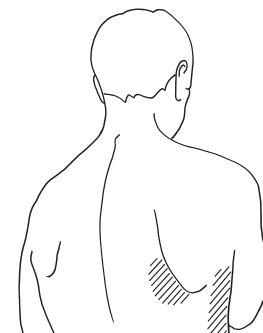
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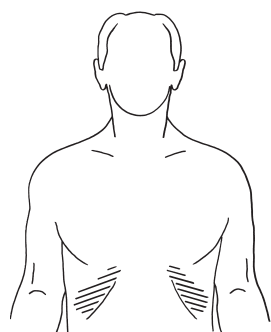
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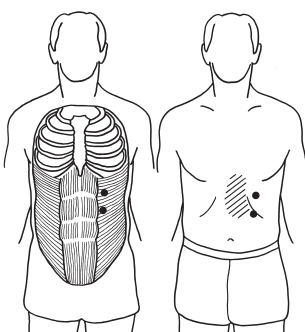
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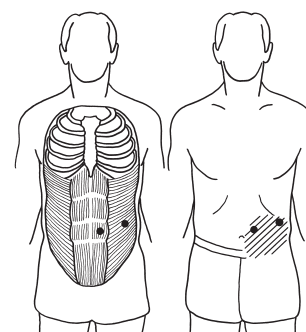
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Diaphragm referred pain pattern. Trigger points are hidden behind the lowest ribs. (p. 171)

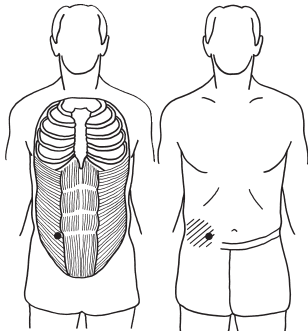


Upper abdominal trigger points and referred visceral pain pattern (p. 174)

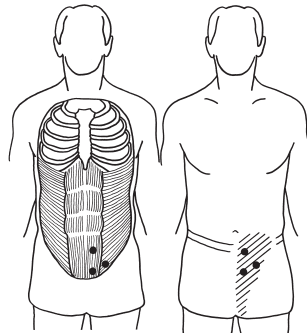


Midabdominal trigger points and referred visceral pain pattern (p. 174)

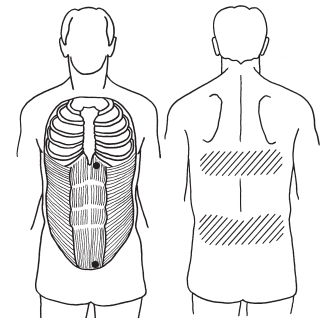
We've made this guide available for download at www.newharbinger.com/24946. See back of book for more details.
Caution: Please read the full treatment instructions for each muscle before beginning.



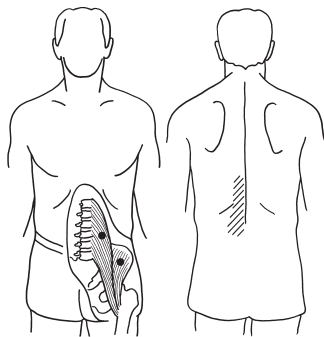
Pseudoappendicitis trigger point and referred pain pattern (p. 174)



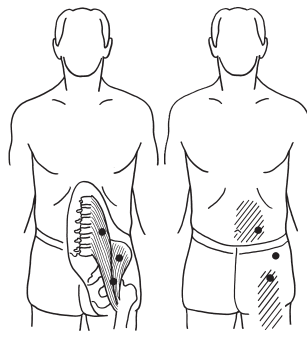
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Psoas and iliacus trigger points and referred pain pattern in the back (p. 178)



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Chest, Abdominal, and Genital Pain

Symptoms from trigger points in chest and abdominal muscles may be subject to more misdiagnosis and misdirected treatment than those in any other part of the body. This is especially regrettable because the solutions are so simple when trigger points are to blame. Trigger point therapy is the appropriate treatment for many kinds of symptoms in the chest, back, side, stomach, shoulder, arm, and hand that originate in chest and abdominal muscles (Simons, Travell, and Simons 1999).

Trigger points in chest muscles can cause distortions of your posture that promote shallow breathing and shortness of breath. Tenderness, pain, and breathing difficulties caused by these trigger points are often mistaken for symptoms of hiatal hernia or lung disease. Pectoral trigger points can cause chest, shoulder, arm, and back pain; heart arrhythmia; and false heart pain. They may contribute to development of a dowager's hump. Their indirect effects on neck and upper back muscles sponsor headaches, jaw pain, and other symptoms of the head, face, and neck. The numbness they cause in hands and fingers can lead to false diagnoses of carpal tunnel syndrome (Simons, Travell, and Simons 1999).

Abdominal trigger points can cause abdominal pain, back pain, heartburn, menstrual pain, false appendicitis, diarrhea, nausea, urinary bladder and sphincter spasms, constipation, and even, rarely, projectile vomiting. Just as the internal organs can cause trigger points in muscles, trigger points can mimic disorders of the esophagus, kidneys, bladder, colon, gallbladder, and other internal organs, including the heart. Colic in babies and stomach-aches in both children and adults can be produced by abdominal trigger points. They're even thought to cause bed-wetting in older children (Simons, Travell, and Simons 1999).

Myofascial pain from lower abdominal and pelvic floor trigger points is commonly felt in the groin, rectum, ovaries, uterus, vagina, penis, and testes, resulting in much needless worry and discomfort. Prostate symptoms and impotence in males from the effects of pelvic floor trigger points is not unusual. Painful intercourse for both sexes can have the same source (Travell and Simons 1992; Simons, Travell, and Simons 1999).

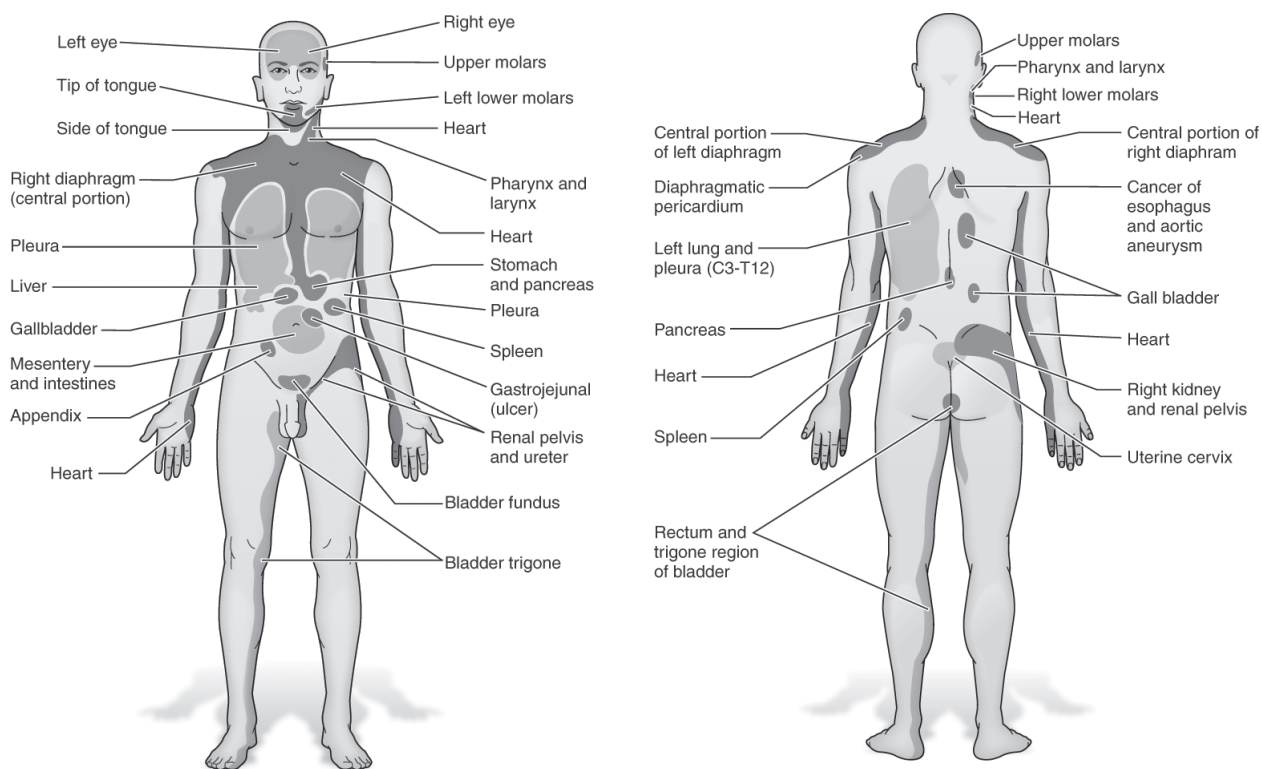


Figure 7.1 Referred pain patterns from internal organs: (A) front of the body and (B) back of the body. Adapted by permission of Rothstein, Roy, and Wolf 1998.

As shown in figure 7.1, many organs cause referred pain and satellite myofascial trigger points. Cancer can also mimic referred pain from trigger points. It is important to rule out any true medical conditions within a timely manner. If something doesn't seem right, your symptoms keep recurring, your gut is telling you to "worry now!," or the pain is severe, see a physician to rule out anything really dangerous. When the physician doesn't find anything wrong with you, rejoice; it may only be muscle pain! Muscle pain can't kill you. Modern practitioners of Western medicine are really good at prolonging our lives by treating and curing diseases; they just aren't yet so good at recognizing and resolving muscle pain. In the following sections, you will find advice for what to massage when no other disorder or disease can be detected. When any of these symptoms are caused by myofascial trigger points, you may be able to handle them yourself with massage.

Pectoralis Major

The *pectoralis* (pek-tur-AH-liss) *major* muscles are the muscular part of the breasts in both men and women. "Pectoralis" comes from *pectus*, Latin for "breast." "Major" means it's the largest of the four pectoral muscles.

Symptoms

Pain from pectoralis major trigger points may be felt in the chest and the front of the shoulder; down the inner arm, the inner elbow (figures 7.2, 7.3, and 7.4), and the ulnar (pinky) side of the hand; and into the fourth and fifth fingers (not shown). Symptoms can be mislabeled as thoracic outlet syndrome. The exact location of the pain depends on the location of the trigger point in several sections of this complex muscle. The outer section in front of the armpit can harbor a trigger point that causes breast pain and nipple hypersensitivity (figure 7.4). A trigger point in the lower border of the pectoralis major can cause an irregular heartbeat (figure 7.5). You might think a trigger point affecting the heart would be on the left side, nearer to the heart, but this arrhythmia trigger point occurs only on the right. The pattern of pain referred from the pectoralis major and other pectoral muscles can be frighteningly like the pain of a heart attack. Confusion regarding chest pain is compounded

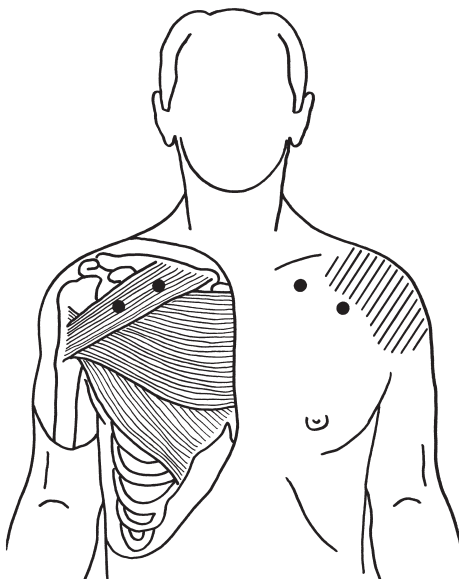


Figure 7.2 Pectoralis major, clavicular section: trigger points and referred pain pattern

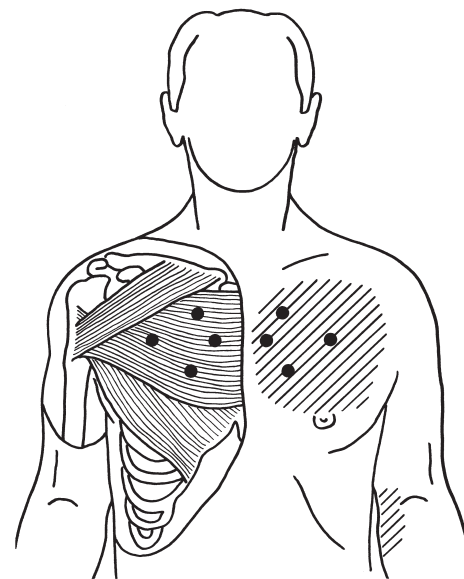


Figure 7.3 Pectoralis major, sternal section: trigger points and referred pain pattern

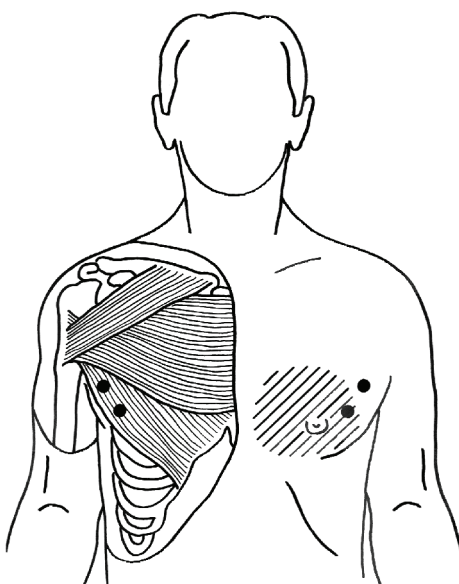


Figure 7.4 Pectoralis major, costal section: trigger points and referred pain pattern

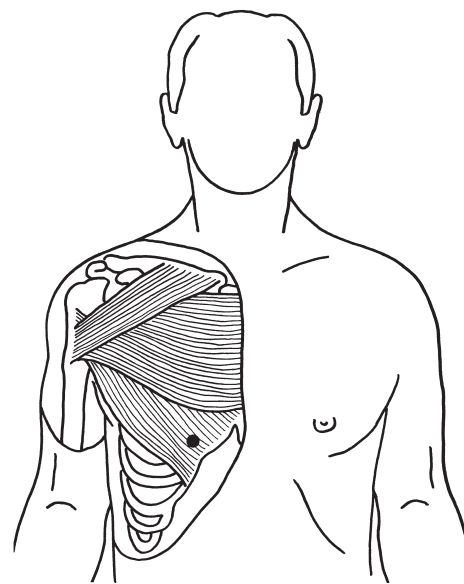


Figure 7.5 Pectoralis major, arrhythmia trigger point

by the fact that genuine heart disease can set up trigger points in the pectoral muscles. Long after an afflicted heart has recovered, you can still have severe chest pain that in reality is coming not from the heart but from the muscles of the chest (Simons, Travell, and Simons 1999).

Anna, age seventy-three, an unknowing sufferer of pectoral trigger points, strapped on a TENS unit (a device for treating nerve-related pain) every day for her chronic midback pain. Unable to wear the unit at night, she regularly had to take a pain pill to enable her to sleep. Trigger points had shortened her pectoral muscles to such an extent that she couldn't pull her shoulders back to stand up straight. After her first massage, she was able to go to sleep without taking her pain medication for the first time in years. Though she's never eager to massage her own pectoral muscles, which are still very tender, her back always feels better when she does.

Tightness from trigger points in the pectoralis major keeps the shoulder pulled forward, making it difficult to reach back and putting a constant strain on the upper back muscles. This round-shouldered posture also causes the head and neck to be constantly projected forward, which sponsors trigger points in the sternocleidomastoid, scalene muscles, and back of the neck muscles. This can make the pectoralis major indirectly the ultimate source of the many symptoms that come from these muscles. The overload imposed on shoulder and upper back muscles by a shortened pectoralis major can lead to the development of secondary trigger points in the anterior deltoid, coracobrachialis, rhomboid, and middle trapezius, progressively limiting movement of the arm and lead to trigger points in the subscapularis, latissimus dorsi, and serratus anterior. Eventually, the infraspinatus, teres major, and posterior deltoid develop antagonist trigger points from being continuous and overstretched and the whole dysfunction ends in a frozen shoulder. The round-shouldered posture fostered by pectoral trigger points can have many unanticipated effects, including chronic upper back pain, excessive pressure on spinal disks, compression of nerves, jaw problems, restricted breathing, chronic fatigue, neck pain, and headaches (Simons, Travell, and Simons 1999).

Unfortunately, attempts to force a correction of your posture generally fail unless you first find and deactivate the specific trigger points that are keeping the pectoral muscles tight. Efforts to stretch these sensitive muscles without releasing their trigger points can make all your symptoms worse. After the trigger points are gone, stretching and postural retraining are quite appropriate and can be expected to have a beneficial effect.

Causes

There are three distinct sections of the pectoralis major. The *clavicular* (upper) section attaches to the collarbone, the *sternal* (middle) section to the breastbone, and the *costal* (lower) section to the ribs and stomach muscles. All come together to attach to the front of the humerus. These attachments allow the pectoralis major to rotate the arm inward and to pull it across the chest. The upper section also helps raise the arm; the lower section helps pull the arm and shoulder down. In vigorous sports activities and many kinds of work, the pectoralis major can be overused by any of these movements done with excessive force or repetition.

Carrying a heavy backpack can be a contributing cause, or possibly the sole cause, of trigger points in muscles of the chest, abdomen, upper back, and neck. Tune in to any muscle tension you feel when you have the backpack on. Part of your trigger point therapy should be to figure out how to lighten your load or find another way to carry it (Simons, Travell, and Simons 1999).

Treatment

In men, the pectoralis major is directly accessible through the skin. In women, the upper half is similarly accessible, but the lower half must be approached through breast tissue or by moving the breast aside as much as possible.

Trigger points will be found in four areas of the pectoralis major. You can locate them by distinguishing their different patterns of pain. Trigger points in the clavicular section send pain to the front of the shoulder (figure 7.2). Trigger points in the sternal section refer pain to the inner arm and the inner elbow (figure 7.3); they also cause pain in the central part of the pectoralis major muscle itself. Sensitivity and pain in the breast come from trigger points in the thick lateral border of the muscle (figure 7.4) (Simons, Travell, and Simons 1999; Long 1956).

The trigger point for a fluttery kind of benign heart arrhythmia is found between the ribs, a couple of inches to the right of the end of the breastbone (figure 7.5). Pressing on this one is sharply painful, but the heart rhythm straightens out right away if the trigger point is to blame. Massage the arrhythmia trigger point with the fingertips. There can be a trigger point in the left side of the breastbone, but it does not create arrhythmia or have a specific pain pattern. The trigger points can be difficult to resolve if emphysema engages you in a constant battle to expel your breath (Simons, Travell, and Simons 1999).

Massage with a tennis ball or 60 mm high bounce ball against a wall in a convex, or “stick out corner,” is very effective for the entire pectoral region (figure 7.6). Using a doorway is also more comfortable than facing a flat wall. Some like the Thera Cane for this, and supported fingers also work very well (figure 7.7). Save your fingers by exerting most of the pressure with the supporting hand. Use short, slow, repeated strokes. For very specific massage of trigger points in the lateral border of the pectoralis major, you’ll have to use your fingers and thumb (figure 7.8). To stay off of major blood vessels, nerves, and lymph nodes, avoid pressing the muscles against the ribs in the area two inches below the coracoid process. Find the coracoid process as directed in the section “The Shoulder Blade” in chapter 5.

Don’t let large breasts be an impediment to massage. Heavy-breasted women are usually well aware of the connection between the weight of their breasts and the aching in their upper back, but they are often unaware of the strain heavy breasts can place on their pectoral muscles.

Pain in or around the breasts can be a serious cause of concern for women, because it naturally arouses fears of breast cancer. Great efforts are being made by health care agencies to get women to do regular self-examinations in order to familiarize them with the natural state of breast tissue and to learn to recognize changes that may represent potential tumor growth. However, physicians and others who monitor women’s health believe that most women don’t do self-examinations, either because they’re terrified at the thought of what they might find or because they don’t clearly understand what they’re looking for (R. M. Hackett, RN, personal communication with Clair Davies, 2000).

This is very unfortunate, because the breast self-exam is an ideal time to learn to distinguish among normal and abnormal lumps in breast tissue and the sometimes lump-like trigger points in the underlying muscles. Very often, pain in the breast area is nothing more serious than pain from trigger points in the chest muscles. A breast self-exam, if done thoroughly and with attention to possible trigger points, should allay fear, not increase it. Working with a doctor or nurse who understands both myofascial pain and the anatomy of the breast itself can be enormously helpful (Hackett, personal communication with author, 2000).



Figure 7.6 Pectoralis major and minor massage with ball against a convex corner or doorway (avoid the area 2 inches below the coracoid process)

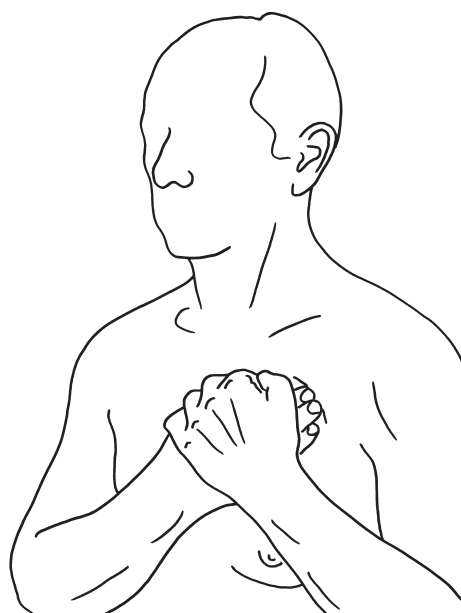


Figure 7.7 Pectoralis major massage with supported fingers

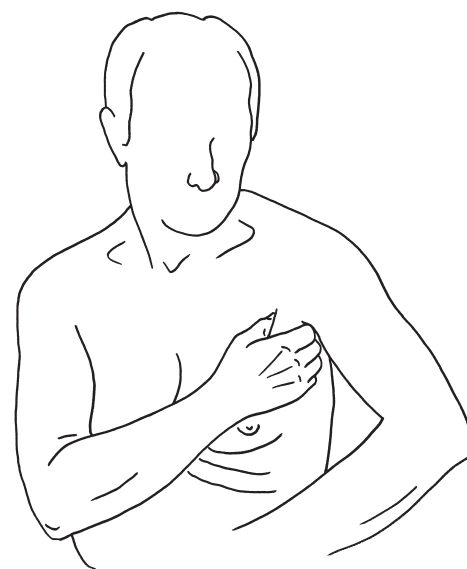


Figure 7.8 Pectoralis major massage of lateral border

Subclavius

The *subclavius* (sub-CLAY-vee-us) muscles lie just under the clavicles, or collarbones. They attach to the middle of the collarbones and to the ends of the first ribs near where they join the sternum, or breastbone. The subclavius muscles pull the collarbones down and forward. They also pull the first rib up. Rounded-shoulder posture from habit, use of a sling, or sleeping in a side-lying position can create trigger points in these muscles (Muscolino 2009).

Considering their small size, the subclavius muscles have a disproportionately widespread referred pain pattern (figure 7.9). Subclavius trigger points cause pain just below the collarbone. They also send pain to the biceps and the radial side (thumb side) of the forearm. Sometimes they cause pain in the thumb side of the hand, the thumb, and the index and middle fingers (not shown). The shortening of the subclavius muscle by trigger points can keep tension on the collarbone, squeezing the subclavian vein and artery against the first rib and restricting circulation in the arm and hand. Symptoms in the subclavius and pectoralis major can mimic thoracic outlet syndrome (Simons, Travell, and Simons 1999).

The subclavius can be difficult to palpate. While sitting at a table, lay your forearm horizontally across the table in front of you. Lean forward and feel with your opposite hand fingertips as this action lifts the collarbone off of the ribs. Search for the exquisite tenderness of its trigger point deep under the middle of the collarbone. Massage with your fingertips. Avoid pressing below the lateral half of the collarbone. Major blood vessels, nerves, and lymph nodes are located here.

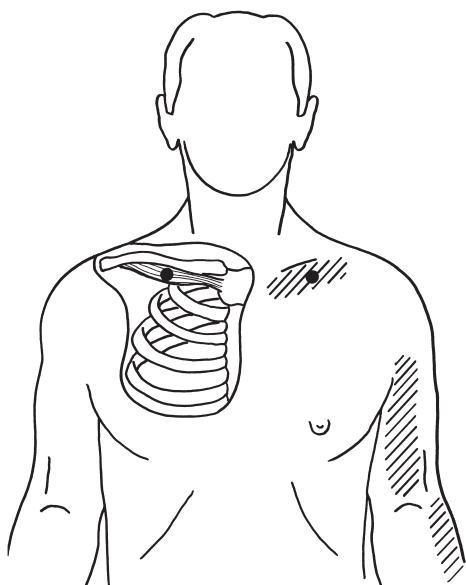


Figure 7.9 Subclavius trigger point and referred pain pattern

Sternalis

Sternalis (stern-AH-liss) muscles are present in only about 5 percent of the population and have no obvious function. When present, their configuration is quite variable. You may have a sternalis on only one side. If you have both, they may overlap or cover the breastbone. Sternalis muscles can be thin or thick. Their name derives from the muscles' location, right alongside the sternum (Simons, Travell, and Simons 1999).

Pain caused by sternalis trigger points is felt strongly in the center of the chest (figure 7.10). Lesser pain may radiate across the chest and the front of the shoulder, and down the inner side of the upper arm (not shown). Trigger points high up in the sternalis, near the lower end of the sternocleidomastoid, muscles may promote a dry, hacking cough.

Trigger points in the sternalis may come about in association with trigger points in the pectoralis major or sternocleidomastoid muscles. Unsuspected trigger points in the sternalis can be to blame for pain that persists after a heart attack or whiplash injury. To find sternalis trigger points, search along the full length of the breastbone on both sides, using supported fingers (Simons, Travell, and Simons 1999; Epstein, Gerber, and Borer 1979).

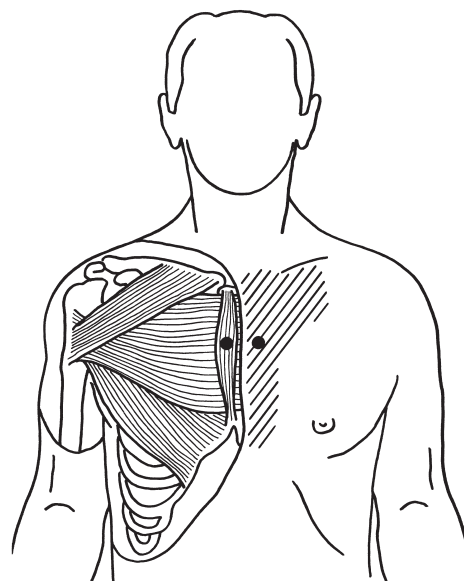


Figure 7.10 Sample sternalis trigger point and referred pain pattern

Pectoralis Minor

The pectoralis minor (pek-tur-AH-liss) muscle lies completely hidden under the pectoralis major and has a different orientation and very different attachments. Though generally a smaller muscle, it can still be very strong and thick. The pectoralis minor attaches at its upper end to the *coracoid process*, an odd little piece of the shoulder blade that sticks through to the front of the shoulder (figure 5.9). With your arm at rest in your lap, you can feel the coracoid process as a hard roundness, something like a marble under the skin, just below your outer collarbone right next to the ball of your shoulder (the head of the humerus, figure 5.16).

The other end of the muscle divides into three or more sections, which attach to individual ribs in the center of the breast area. The action of the pectoralis minor is to pull down on the coracoid process to fix the shoulder blade in place for various operations of the arm. A secondary function is to pull up on the ribs to assist expansion of the chest during forced breathing, such as in vigorous sports activity, coughing, or sneezing, all of which can cause pain when trigger points are present.

Trigger points in the pectoralis minor cause symptoms similar to those of pectoralis major trigger points, but a troubled pectoralis minor can have peculiar effects all its own, as illustrated by Aaron's case.

Aaron, age fifty-two, an executive with an automobile company, experienced recurrent pain in the front of his left shoulder ever since he'd "messed it up" in a volleyball game ten years earlier. He also had numb fingers most of the time. "Man, I've tried everything, including a lot of physical therapy, but it just doesn't go away." In an effort to strengthen his shoulder, Aaron had been doing aerobics in the pool at the YMCA. So far, it had only made the pain worse. Active trigger points were found in Aaron's scalene and pectoralis minor muscles. All were far more tender on the left side than on the right. Pressure on his left pectoralis minor accentuated the pain in the front of his shoulder and the numbness in his hand. He could hardly believe that the problem and its solution were so simple. After a single professional massage and instruction in self-applied massage, Aaron got rid of his chronic, long-term pain and numbness in less than three weeks.

Symptoms

The referred pain pattern for the pectoralis minor is nearly the same as for the clavicular section of the pectoralis major, being felt primarily in the front of the shoulder (figure 7.11). Pain sometimes spills over to the entire breast area and the inner arm, inner elbow, ulnar (pinkie) side of the hand, and third, fourth, and fifth fingers (not shown). As with trigger point symptoms in other pectoral muscles, this distribution of pain can be mistaken for signs of heart disease (Simons, Travell, and Simons 1999).

Tightness from trigger points often causes the pectoralis minor muscle to compress the axillary artery and the brachial nerves, which go to the arm and which are major neurovascular pathways. Blood flow to the arm and hand can be restricted in this manner by the pectoralis minor, even to the point of making the pulse at the wrist hard to detect. Swelling in the hand and fingers, however, is not a symptom of pectoralis minor trigger points, but is caused rather by tight scalenes compressing the axillary vein, which runs under the scalenes but not under the pectoralis minor (Simons, Travell, and Simons 1999; Rubin 1981).

Numbness in the forearm, hand, or fingers caused by a taut pectoralis minor squeezing the brachial nerves may be misdiagnosed as carpal tunnel syndrome. Pectoralis minor entrapment syndrome is a more appropriate diagnosis to use when the pectoralis minor is responsible for compression.

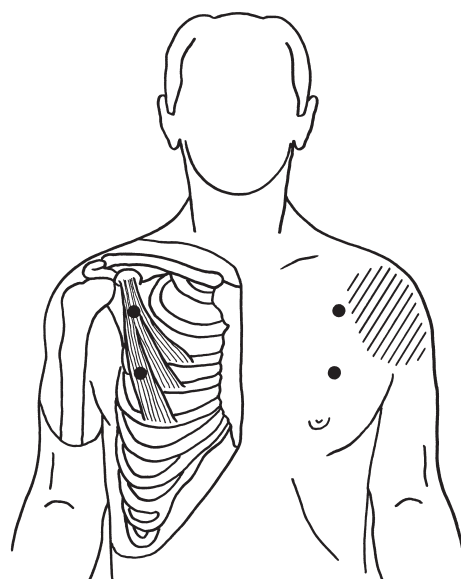


Figure 7.11 Pectoralis minor trigger points and referred pain pattern (avoid deep pressure between the coracoid process and the upper trigger point)

Recall that the scalenes provoke similar numbness and a similar interpretation. Pain from the scalenes is often sent to the chest, to the exact location of the pectoralis minor, and can be one reason for development of its trigger points. If there are multiple sites of nerve compression, the diagnosis may be multiple or double crush syndrome. With either of these compression syndromes, trigger point massage can be effective treatment (Simons, Travell, and Simons 1999; Waslaski 2012).

The round-shouldered posture imposed by shortened pectoralis minor muscles can cause an ache in the midback due to strain on the lower trapezius muscles. See the section on Active and Latent Trigger Points in chapter 2 for more information. Excess tension in the pectoralis minor pulls the shoulder blade forward and causes it to stick out in back. This “winging” of the shoulder blade is made worse when the lower trapezius is weakened by trigger points and can’t resist the pull of the pectoralis minor. This tightness in the pectoralis minor also restricts movement of the shoulder blade on the chest wall. As a consequence, it may be difficult to raise your arm above your head or reach for something behind you. Attempts at therapeutic stretching of the pectoralis minor must be cautious because of the stress placed on its vulnerable attachments (Simons, Travell, and Simons 1999; Lewit 1991).

Causes

Hyperventilation or a tendency to do chest breathing can seriously overtax the pectoralis minor, as can a chronic cough. Whiplash injuries can overstretch the pectoralis minor muscles and set up trigger points. Pressure from the straps of a backpack or a heavy purse can cause them by cutting off circulation. Repetitive, forceful, downward motions of the arms in sports or in the workplace can wear these muscles out and promote trigger points. As with the pectoralis major, a habitually slumped, round-shouldered, head-forward posture can also set up trigger points in the pectoralis minor and make them very persistent.

If you have recurrent trouble with your pectoralis minor muscles, start watching for circumstances that tend to cause or perpetuate their trigger points. Under stress, you may be unconsciously holding your breath, subtly hyperventilating, or breathing very shallowly with your chest and not your abdomen. Watch your body in a mirror as you breathe. If you are chest breathing, your shoulders will rise and fall as the trapezius, scalenes, pectoralis minor, sternocleidomastoid, and serratus muscles work hard to expand the ribcage. Ideally, the abdomen should expand outward with each inhalation instead of the upper chest. A hunched posture could be keeping the chest muscles shortened and tight.

Heavy lifting will get you in trouble with the pectoralis minor, just as with the scalenes. Working for long periods with your arms out in front of you or up overhead will do the same. Check regularly for trigger points in both of these muscles. They shouldn’t hurt when you touch them; tenderness indicates latent trigger points.

Treatment

You can locate the pectoralis minor by feeling it bulge up when it contracts. To make the pectoralis minor contract without contracting the pectoralis major, put your hand behind your back, and then push back with your hand against a wall or the back of a chair. While doing this, put your other hand on your chest, as you would for the Pledge of Allegiance; your fingertips will then be in the right position to feel the pectoralis minor contract (figure 7.12).

There may be more than one trigger point in the pectoralis minor muscles because of the varying length of muscle fibers in the different heads. Execute massage with supported fingers, beginning at the coracoid

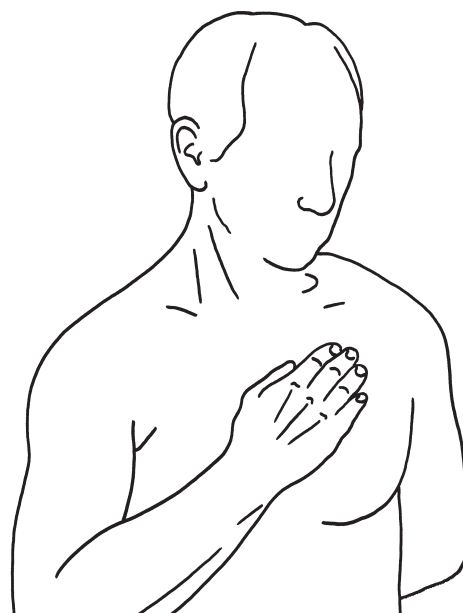


Figure 7.12 Locating pectoralis minor. The hand behind the back is pushing against a wall.

process and pulling downward on a diagonal line across the chest, with very slow, deep, short strokes (figure 7.7). The fingertips of the hand opposite to the side you're massaging will be on the trigger points. The supporting hand helps exert pressure. The lower trigger point is in the curve of the chest wall. This point is not quite on the side and not quite on the front of the body. Try pulling the pectoralis major out of the way and pressing into the ribs just above and to the outside of the center of the breast. The upper trigger point is a couple of inches higher, in a straight line up toward the coracoid process. Press through the pectoralis major to massage it. Avoid deep pressure to the area about two inches down from the coracoid process to protect major blood vessels, nerves, and lymph nodes. An even more ergonomic tool is a tennis or 60 mm high bounce ball against a wall, a convex corner, or a doorway (figure 7.6). A Knobble will also save your fingers, as will supported knuckles.

Serratus Anterior

Although the *serratus* (seh-RAY-tus) *anterior* is located under the arm, it's actually a shoulder muscle. The muscle's attachments to your ribs and to the inner border of the shoulder blade give it leverage for rotating the shoulder blade so that the socket of the shoulder joint faces more in an upward direction, allowing you to raise your arm. Without this ability to reposition the shoulder blade, you wouldn't be able to raise your arm above your head. The serratus anterior muscles also aid inhalation by assisting expansion of the ribs when you need more air than usual. They cause trouble for chest breathers like Judy, who habitually overwork them.

Judy, age twenty-seven, a social worker, got such a sharp pain in her sides when she was under stress that it was almost impossible to breathe. In her job, she was under stress every day. "When I've got that pain, I can only inhale to about 10 percent of my lung capacity. I can't climb stairs, I can't get enough air, and I can't do anything. It's like I've got a metal band strapped around me. I can't take a deep breath at all. If I suddenly cough or sneeze, it is so painful that my knees buckle and I literally fall down." Extremely tender latent trigger points were found in Judy's serratus anterior muscles. She was shown how to do serratus anterior massage with her fingertips when she feels an episode coming on. Even when the attack is severe, she's able to get rid of the pain in her sides within a couple of hours. As a preventative measure, she's learning to relax, breathe with her abdomen, and work on her posture.

Symptoms

Pain from trigger points in the serratus anterior muscles is usually felt in the side and often in the midback at the lower end of the shoulder blade (figures 7.13, 7.14, and 7.15). Sometimes pain spills over to the inner side of the arm and forearm and to the pinky side of the hand (not shown). This pain pattern can suggest lung disease or a heart attack, and its true source can remain a mystery unless you're wise to myofascial pain (Simons, Travell, and Simons 1999).

With serratus anterior trigger points, you can't take a deep breath without pain, nor can you exhale completely. Diaphragmatic breathing hurts, so you're limited to shallow chest breathing. A troubled serratus anterior can be a cause of the painful "stitch in the side" so familiar to runners. Side stitch can also come from diaphragm or intercostal trigger points. Pain or muscle spasms in this area can also be the first symptoms of a shingles outbreak. Unlike trigger points, shingles can also cause redness, rash, and hypersensitivity. Referred breast tenderness can be a symptom of serratus anterior. Tightness in the serratus anterior muscles makes it hard to reach behind yourself or pull your shoulders back. Serratus anterior trigger points can add to pain usually associated with a heart attack (Simons, Travell, and Simons 1999).

Emphysema isn't thought to promote trigger points in the serratus anterior, but when trigger points are present for other reasons, they can add significantly to the pain felt by emphysema sufferers and to their difficulty in expelling air. When the serratus anterior is in trouble, additional stress is put on the scalene, sternocleidomastoid, and serratus posterior muscles, all of which aid in forced breathing. This can result in a growing cascade of symptoms,

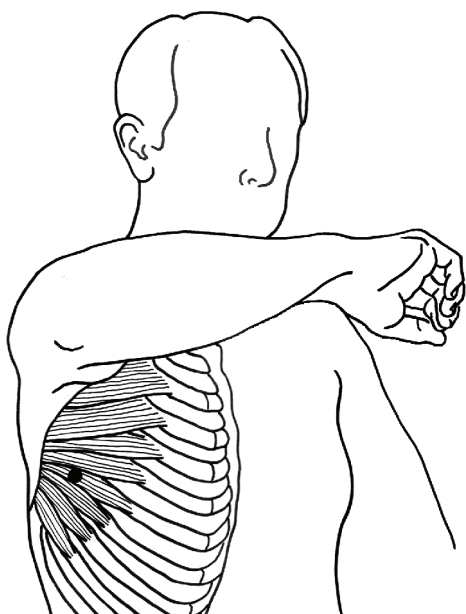


Figure 7.13 Serratus anterior primary trigger point on sixth rib. Trigger points may be in any of the muscle's branches.

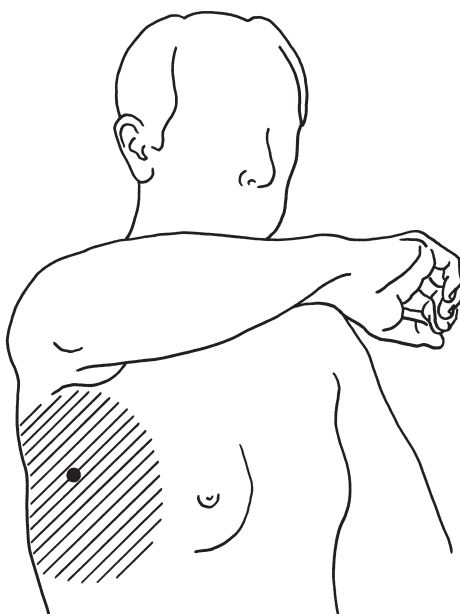


Figure 7.14 Serratus anterior referred pain pattern (side stitch)

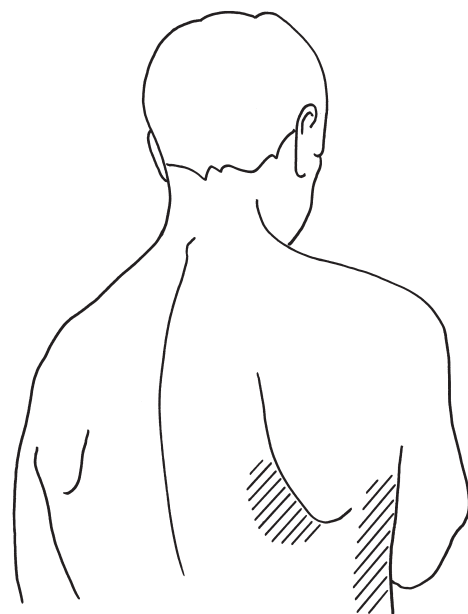


Figure 7.15 Serratus anterior referred pain pattern in the back

from headaches and jaw pain to dizziness and numb hands, making a whole list of mistaken diagnoses possible (Simons, Travell, and Simons 1999).

Causes

When you need extra breath quickly, as in vigorous sports activity, the serratus anterior muscles assist respiration by pulling on the ribs to expand the chest. For this reason, athletic exertion, especially when you're out of shape, can quickly overtax these muscles. It's usually the amateur or weekend athlete who gets the stitch in the side, not the well-tuned, resilient professional. Since the serratus anterior is so active in movements of the arm and shoulder, it's particularly vulnerable to participation in tennis, swimming, running, chin-ups, push-ups, weight lifting, and workouts on the pommel horse or the rings.

Respiratory illness that involves strenuous coughing can activate trigger points in the serratus anterior muscles. The pain in your sides and back can make you think you're progressing to pleurisy or pneumonia.

Treatment

You can find the primary serratus anterior trigger point on the most prominent rib on your side, about a hand's width straight down from your armpit. Generally, this will be the site of greatest tenderness. When this trigger point is very active, you won't like touching it: this one can really hurt. Luckily, it doesn't take much pressure to have an effect. Be aware, however, that trigger points can exist on any of the nine ribs this muscle attaches to. If you have trouble getting rid of the pain in your side, search the whole rib area under the arm, clear up into the armpit. Trigger points in the abdominal obliques, which attach to your lowest ribs, also cause pain in the side.

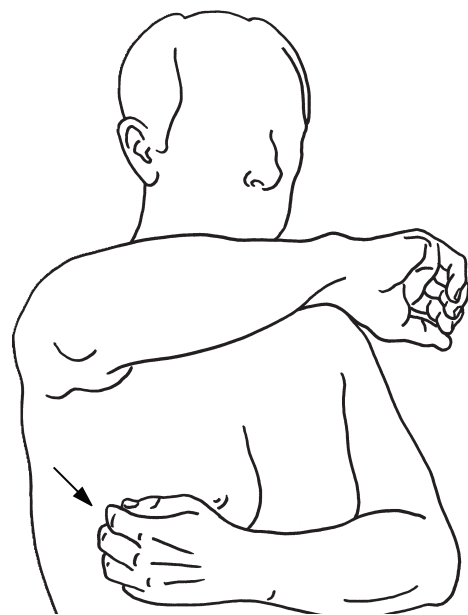


Figure 7.16 Serratus anterior massage using fingertips or tennis ball. The arm is up for clarity. Keep it down for massage.

The fingertips can be used for deep stroking massage of serratus anterior muscles (figure 7.16). You can try a ball on a wall, but it may be too intense for this muscle. Or just hold the ball in your hand and pull it slowly across the trigger point. Additional pressure can be applied by clamping the ball and the hand against your side with your arm.

If you want to avoid trouble in the first place, be mindful of the fact that emotional stress promotes habitual muscle tension, which predisposes serratus anterior muscles to trigger points. Learn to be aware of when you're holding your breath or breathing with your chest. To learn practical ways to reduce habitual muscle tension, read chapter 12.

Diaphragm and Intercostal Muscles

There are a number of muscles that are not treatable with massage, because they are simply too deep inside to be accessible. Muscles inside the chest fall into this class. Luckily, the real troublemakers are on the outside. The *diaphragm* and the *intercostal muscles* are on the borderline. The intercostal muscles are between the ribs and can be massaged with your fingertips. The edge of the diaphragm can be reached under the ribs in front. There's precious little access to these important muscles, but it's enough to do a significant amount of good.

Symptoms

Pain from an intercostal trigger point is usually felt right around the trigger point, although it can refer a short distance toward the front of the body. The pain can be bad enough that you may not be able to turn your body or raise your arm. Trigger points in the diaphragm cause pain under your ribs in front, near the diaphragm's attachments behind the bottom ribs (figure 7.17). Pain typically occurs on exhalation. With trigger points in either the diaphragm or the intercostals, you may experience the same "stitch in the side" and shortness of breath as with the serratus anterior.

Myofascial pain associated with the ribs may be mislabeled "costochondritis," or inflammation of the ribs. You may be told you have a separated rib, ulcers, or gallbladder trouble. Treatment for these conditions is not likely to solve the problem when trigger points are the cause (Simons, Travell, and Simons 1999).

Causes

The diaphragm is a thin muscle inside the body that separates the organs of the chest from those of the abdomen. It attaches to the inside of the lowest ribs all the way around your body. At rest, the diaphragm has a dome shape, bowing up into the lower chest. Upon inhalation, the diaphragm contracts and pulls down, flattening out and creating a vacuum in the chest that causes the lungs to inflate. To exhale, ordinarily all you do is relax the diaphragm. When you're breathing heavily, your intercostal muscles are called on to help force the air out. To inhale properly, you have to allow the abdominal organs to move out of the way to make room for the diaphragm to come down. If you strive to keep your stomach flat at all times for the sake of appearances, you unnecessarily hamper the mechanics of natural breathing.

Anxiety, chest breathing, and overexertion in athletics cause trigger points in the diaphragm and the intercostal muscles. Direct trauma or chest surgery can leave the intercostals with trigger points, as can a chronic cough.

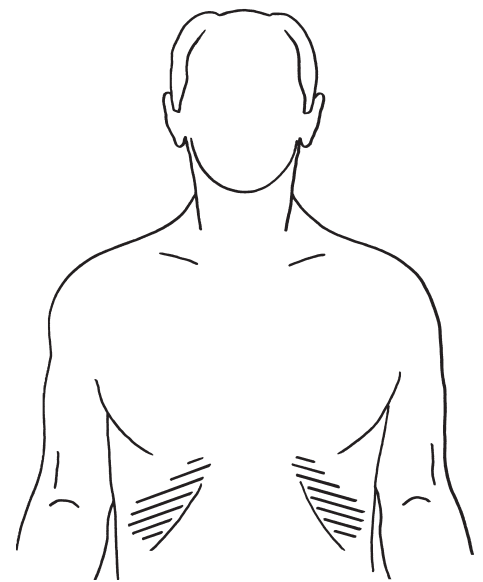


Figure 7.17 Diaphragm referred pain pattern. Trigger points are hidden behind the lowest ribs.

Any condition that makes you struggle to get your breath can cause trigger points to develop in the diaphragm (Simons, Travell, and Simons 1999; Bonica and Sola 1990).

Intercostal trigger points can also come from excessive twisting of the body. They may come on after a case of shingles. A slumped posture can foster and perpetuate trigger points in both the diaphragm and the intercostals (Simons, Travell, and Simons 1999).

Treatment

As with the serratus anterior, intercostal trigger points derive benefit from only light pressure massage. That's good, because you won't be able to stand very much pressure when they're at their worst. Use the tips of your fingers and search between the ribs in the area where you have the pain. You may have to work on intercostal trigger points in a number of short sessions over several days to get them under control.

For diaphragm trigger points that are accessible, dig under your bottom ribs in front with your fingers and do as much deep stroking massage as you can manage (figure 7.18). Your hands and fingers will tire quickly with this, so do short sessions and keep coming back to it. Easier access is gained by pulling the stomach in and exhaling completely. This also stretches the diaphragm, which can be beneficial when done along with the massage. For

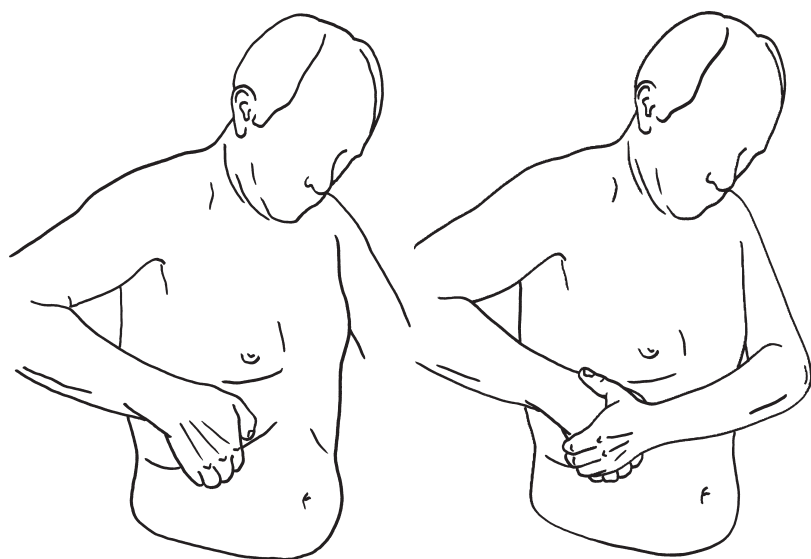


Figure 7.18 Diaphragm massage with supported fingers digging up behind the lowest ribs in front. For deepest penetration, sit and lean forward.

deepest penetration, sit and lean forward, or lie on your back with your knees up. Any work you do on the diaphragm's peripheral trigger points will benefit any you may have in its unreachable central dome by releasing the general tension on the muscle. Note that taking a deep breath can overcontract your diaphragm, so it's wise to avoid athletics until some progress is made.

A slumped, head-forward posture contributes to problems with the diaphragm and intercostal muscles. Remember, however, that slumped posture may be difficult to correct until trigger points are deactivated in the abdominal and chest muscles. To help all your breathing muscles, learn to breathe with the abdomen instead of the chest. Stop smoking, and take any other action necessary to inhibit chronic coughing.

Abdominal Muscles

The abdominal muscles cover the front and sides of the abdomen. The *rectus abdominis*, the vertical central slab of abdominal muscle, attaches the lower ribs to the pubic bone. The *abdominal obliques*, the muscles on the sides of the abdomen, attach to the ribs, the abdominal *aponeurosis* (fascia covering the rectus abdominis), the *inguinal ligament* (ligament connecting the front of the pelvis to the pubic bone), the crest of the pelvis, and the *thoracolumbar fascia* (fascial covering of the spinal muscles). The abdominal obliques are composed of three layers of muscle, each with fibers running at a different angle, like the plies of a tire; they are called the *external oblique*, the *internal oblique*, and the *transverse abdominis*.

The abdominal muscles function as a unit to flex the trunk forward, to twist it, and to bend it to the side. They serve as a checkrein when you lean over backward. They help stabilize the spine and support the body during every kind of activity. In both normal and forced breathing, they help expel air from the lungs. Interestingly, their

respiratory actions also alternately squeeze and release the large veins in the abdomen, assisting the heart in pumping blood up from the legs. Abdominal muscles also provide a tight container for the internal organs and pressure for the actions of childbirth, vomiting, urination, and defecation. The extreme exertion of vaginal childbirth can leave a woman with a belly full of trigger points (Simons, Travell, and Simons 1999).

Trigger points in the abdominal muscles not only cause pain in the stomach, sides, and back, but also send pain to the organs inside the abdominal cavity and to the sexual organs of both men and women. Travell and Simons call the diverse and often very indirect effects of abdominal trigger points “diagnostically very misleading” (Simons, Travell, and Simons 1999).

Bruce, age sixty-nine, still active in his hardware business, experienced severe pain on the left side of his abdomen that felt like it was in his bottom ribs. The pain had started six weeks earlier, just after he began a new set of stomach-strengthening exercises that he'd hoped would help his chronic back pain. He wore a broad elastic back brace and his posture was very stooped and hunched, with rounded shoulders and an upward-tilted pelvis that gave him the shape of a large letter C.

The pain in his ribs increased when he was getting dressed, especially when he lifted his legs to put on his pants. The doctor's opinion was that Bruce had costochondritis, or inflammation of the ribs. “We don't really know what causes it,” the doctor said. “All we can do is let the body heal itself. In the meantime, we'll give you a good analgesic to help with the pain.” But the pain pills didn't take away very much of Bruce's pain, in either his ribs or his back, and they didn't improve his stooped posture. Disgusted with his doctor and desperate for help, he tried a massage therapist. Exceptionally painful trigger points were found at several places in Bruce's abdominal muscles, especially where they attached to the ribs. Massage to his abdominals not only eased his rib pain but also diminished the pain in his back. Two weeks later, after daily self-applied massage, he reported that he was able to stand straighter and that the rib pain was completely gone. His back had improved so much from the abdominal massage that he was able to go without the elastic back brace he'd worn for so long.

Symptoms

Abdominal trigger points cause both external and internal abdominal pain. Pain and other abdominal symptoms are usually assumed to have internal causes, however, and mistaken diagnoses are common. People have been subjected to unnecessary abdominal surgery when myofascial pain has gone unrecognized (Simons, Travell, and Simons 1999). Often there are other symptoms the doctor can use to help diagnose a true medical condition. See the box for a list of common signs that medical help is necessary. Diagnosis becomes more accurate and treatment of abdominal symptoms becomes more effective when the physician knows about trigger points, which can be all or only part of the problem (Simons, Travell, and Simons 1999)

Pain in the upper abdomen from trigger points (figure 7.19) can feel like discomfort from heartburn, acid reflux, esophagitis, hiatal hernia, gallstones, stomach cancer, peptic ulcers, heart disease, or simple indigestion. In rare cases, these upper trigger points also cause nausea, projectile vomiting, and loss of appetite.

There are five things that should alert you that a visceral problem could be causing part or all of your pain (adapted from Gray 2004, 361):

1. Your pain is constant and doesn't change with changes in body position or activity.
2. Pain increases with exertion that doesn't stress the areas of pain. Example: shoulder pain that increases with walking.
3. Pain increases after eating, during bowel or bladder activity, or while coughing or breathing deeply.
4. Pain is accompanied by gastrointestinal symptoms like indigestion, nausea, vomiting, diarrhea, constipation, or rectal bleeding.
5. You also have symptoms such as fever, night sweats, pale skin, dizziness, fatigue, or unexplained weight loss. Be aware, however, that trigger points can also cause nausea, dizziness, and fatigue, and that you can have both trigger points and visceral referred pain concurrently.

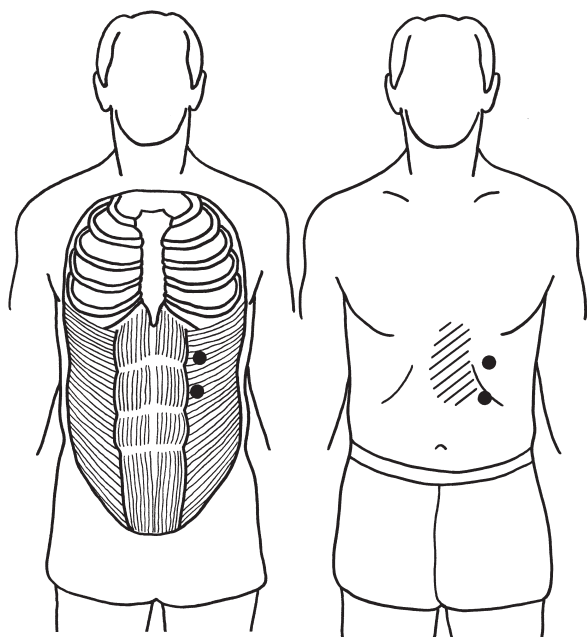


Figure 7.19 Upper abdominal trigger points and referred visceral pain pattern

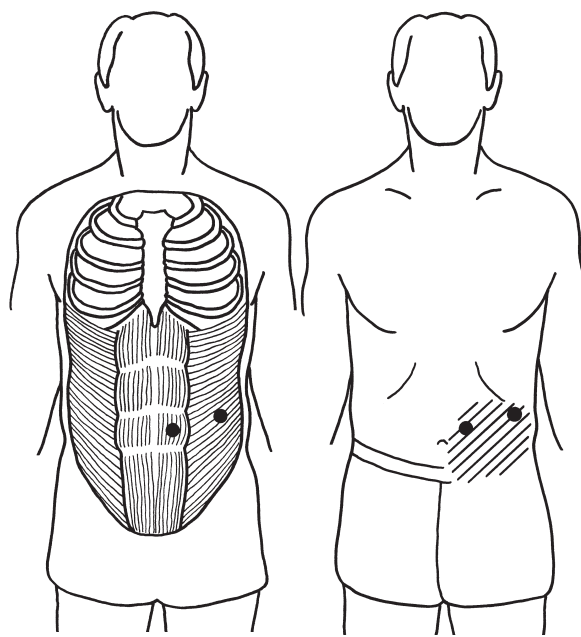


Figure 7.20 Midabdominal trigger points and referred visceral pain pattern

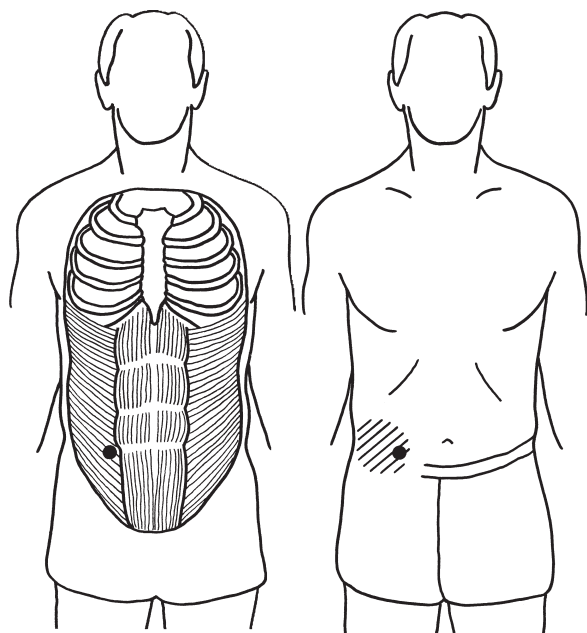


Figure 7.21 Pseudoappendicitis trigger point and referred pain pattern

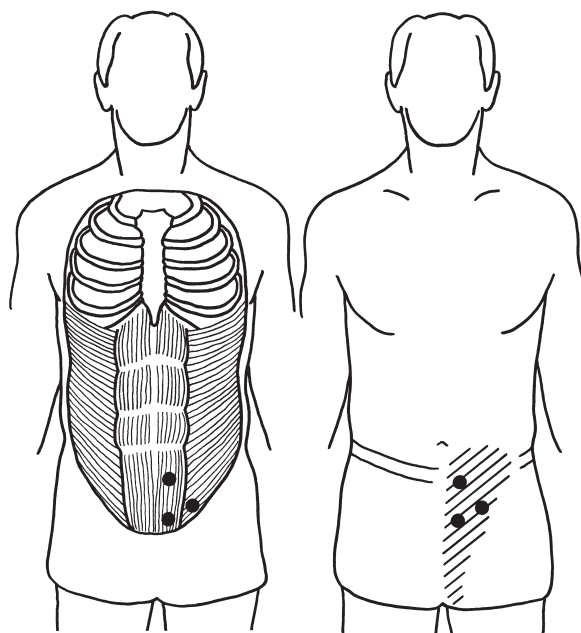


Figure 7.22 Lower abdominal trigger points and referred groin and genital pain (both genders)

Trigger points in the midabdomen (figure 7.20) can be to blame for colic, stomach cramps, and chronic diarrhea. When a trigger point occurs on the right side of the abdomen in the area of the appendix, it can do a convincing job of mimicking appendicitis (figure 7.21). The lack of an elevated temperature and blood tests that come up negative for appendicitis are good reasons to look for trigger points in the nearby abdominal wall. A trigger point in the back where the abdominal obliques attach to the fascia covering the spine can cause excessive belching or even projectile vomiting. This spot is just below the ribs about three to four inches out from the spine (Simons, Travell, and Simons 1999; Good 1950).

Lower abdominal trigger points can make you think you have an inguinal hernia (figure 7.22). They also cause painful spasms in the urinary bladder and may affect urine retention, making urination difficult in some cases and hard to control in others. The exasperating and frustrating bed-wetting in older children can be due to trigger points in the lower abdominal muscles. Adults who unexpectedly wet themselves may have trigger points in the abdomen and pelvic floor that are contributing to the problem (Simons, Travell, and Simons 1999).

Lower abdominal trigger points also cause a great deal of unnecessary distress when they refer pain to the sexual organs. Much of the menstrual pain felt in the lower abdomen, as well as chronic pain in the ovaries, uterus, and vagina, may come from trigger points in the lower abdominals. Pain in the penis and testicles may be nothing more serious than these same lower abdominal or pelvic floor trigger points (Simons, Travell, and Simons 1999). There are several muscles that can cause chronic intrapelvic pain, so be sure to check out all of the muscles listed in the Pain Guide and Other Symptoms Guide at the beginning of this chapter.

Pain in the abdominal muscles themselves can come from trigger points. The referral isn't always easy to trace, however, because a trigger point on one side of the abdomen can cause symptoms on both sides or even in another part of the abdomen (Simons, Travell, and Simons 1999). Referral of pain to the back from abdominal muscles is quite common and is felt in broad, horizontal bands (figure 7.23). Back pain that gets worse when you take a deep breath can be a sign of trigger points in the abdominals (Simons, Travell, and Simons 1999).

Myofascial symptoms are made worse with moving, standing, or sitting. Symptoms are not changed by eating or elimination. Discomfort from trigger points in the abdominals encourages chest breathing and a slouched posture, which then keep the stomach muscles shortened. Shortened muscles, of course, perpetuate trigger points.

Causes

Overexertion on the job or in athletic activity can promote trigger points in the abdominal muscles. Overexercising a soft stomach with sit-ups and leg-ups is famous for making trouble. Sitting in a twisted position, sitting too much, a chronic cough, and emotional stress can all provoke trigger points in the abdominals. The abdominals are among the muscles that are overworked by carrying a heavy backpack. Fatigue is also a factor. That

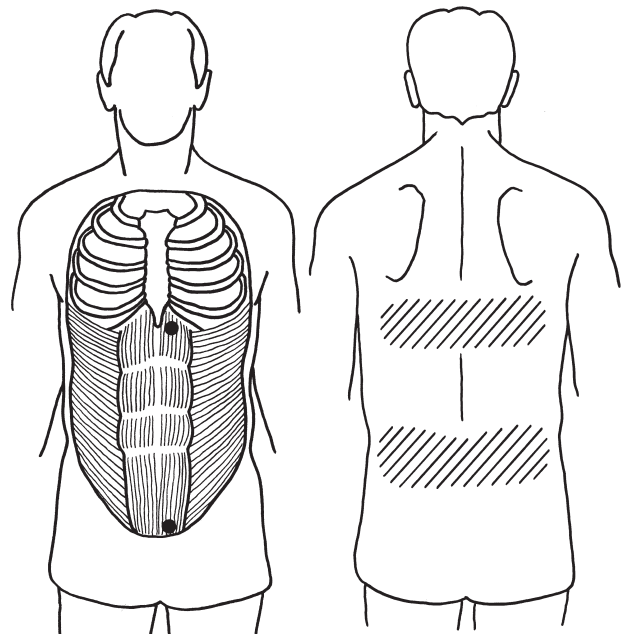


Figure 7.23 Abdominal trigger points and referred pain patterns in the back

There is an easy test to see if your symptoms are at least in part coming from the muscles. Lie on your back, find an area of discomfort—either a trigger point or an area of referred pain—and then, while pressing into the pain, raise both of your legs off of the bed. If the pain decreases, the discomfort is coming from an internal source. If the pain stays the same or increases, the muscle is causing the pain. If raising both legs is too hard, raise your head and shoulders instead (Chaitow and Fritz 2006).

end of the day “my back is breaking” feeling can be greatly relieved with a little trigger point massage to the abdomen.

Trigger points can be initiated in the abdominal muscles by internal disease and can be the reason for continuance of pain after the disease is cured. Pain that persists long after abdominal surgery can be traced to trigger points that the surgery itself created. Scar tissue can be quite problematic for the myofascial system. Trigger points that form in scar tissue can have diverse pain patterns and create quite a bit of distress. Scars can be successfully massaged upon the doctor's approval after an incision has healed. Even really old scars can benefit from massage (Chaitow and Fritz 2006; Simons, Travell, and Simons 1999).

Most people have latent trigger points in their abdominal muscles and never suspect it until they look for them. The first step in preventing future problems is to get rid of the hidden problems that already exist. To do this, it is important to get acquainted with your tummy. Take the time to search out and deactivate latent trigger points in this troublesome area.

Treatment

Let's organize the abdomen into three regions: the upper, lower, and middle. Trigger points in the upper abdominals should be treated with deep stroking massage with your fingers supported in a way different from the usual position (figure 7.24). Search all along the ribs, from the center clear out to the sides. Trigger points may be found on the surface of the ribs, on the bottom edge of the ribs, or just under them. Remember that trigger points can happen on either side of your abdomen. It's interesting to note that one small trigger point just on the right or

just on the left can create a whole band of pain across the upper back. You will certainly find tender spots to massage in your spinal erector muscles, but they won't likely be the source of the problem. You may work this area while sitting, standing, or lying down.

The lower abdominal trigger points will all be found below belt level. Massage them with supported fingers (figure 7.25). Push the muscles down against the top of the pubic bone and the hip bones. Search all along the bones, from the middle on out to the sides. Massage to the lower abdominal region is best done while you're lying down. The trigger points low in the rectus abdominis that cause a horizontal pain pattern all the way across the low back will be found on the top edge of the pubic bone. Press down into the pubic bone from above. Expect these trigger points to feel quite sensitive, almost like bruises.

According to Janet Travell, women can minimize their menstrual discomforts by massaging the lower abdominal area regularly between periods, daily if necessary (Simons, Travell, and Simons 1999). If abdominal massage is made a habit, there's really nothing to it. It requires only a few minutes at bedtime and another few minutes first thing in the morning.

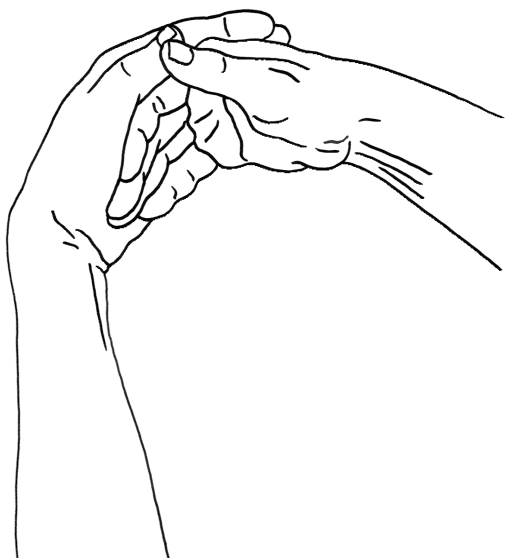


Figure 7.24 Supported fingers for upper abdominal massage



Figure 7.25 Supported fingers for lower abdominal massage

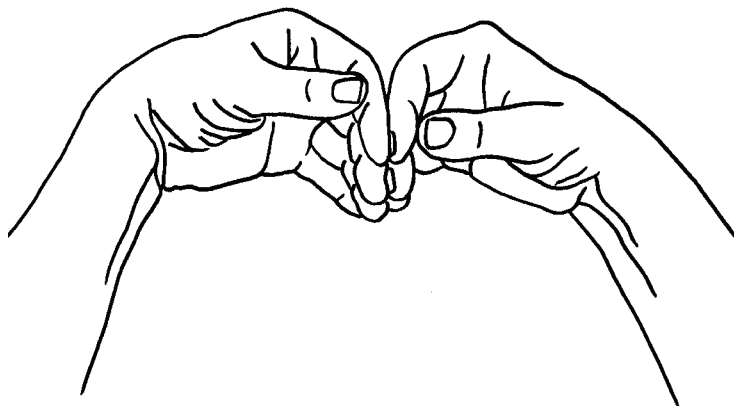


Figure 7.26 Supported fingers back-to-back for midabdominal massage. The third and fourth fingers of both hands are the primary tools and are placed as much as possible on the same spot.

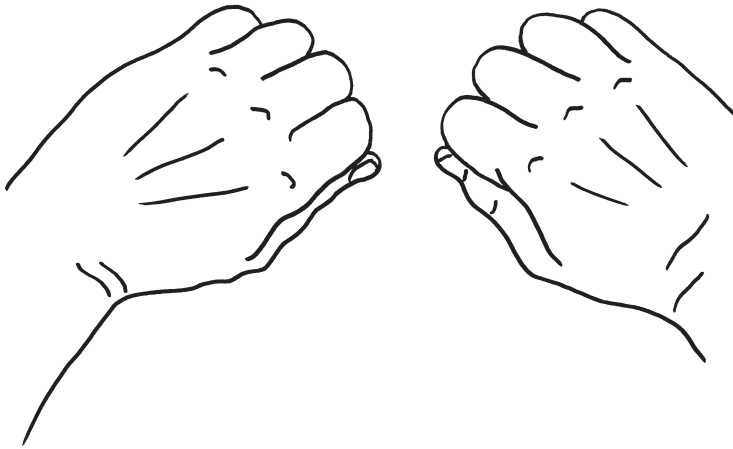


Figure 7.27 Supported thumbs in opposition for midabdominal massage

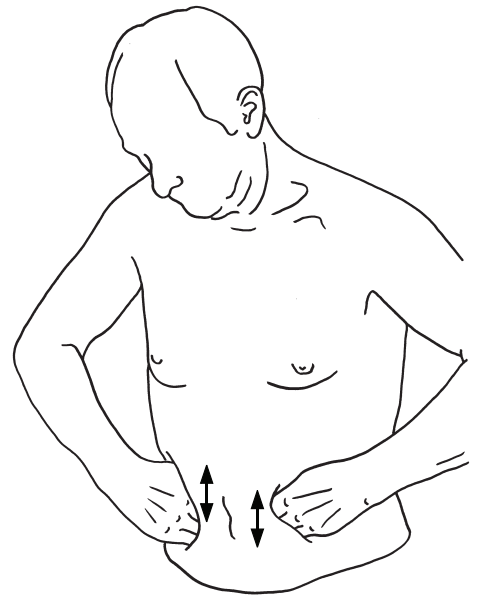


Figure 7.28 Massage of midabdomen with tummy squeeze. Move hands up and down in opposite directions.

Midabdominal trigger points should be addressed with the fingers back-to-back (figure 7.26). This works exceedingly well in all areas of the abdomen but works best when you're lying on your back. Make note that the third and fourth fingers of both hands are the primary tools and are placed as much as possible on the same spot. This lets them work like a gang of fingers, and it makes their job much easier.

In doing abdominal massage, remember how important it is to support your fingers to avoid straining them. For the safest and most effective massage, cut and file your nails and use the very tips of your fingers, not the flats, on the trigger points. Do the massage through a layer or two of your clothing to protect the skin from abrasion. Use slow, deep strokes in one direction only, moving the skin with the fingers.

Trigger points in the midsection and sides of your stomach can also be kneaded with opposing thumbs (figure 7.27). This can be done standing or lying. Move your hands up and down in opposite directions, squeezing the knots in between them (figure 7.28). Move your hands into different positions, vertically and horizontally, to trap different trigger points. Common stomachaches often respond very well to this “tummy squeeze.” Massage can be used on a colicky baby if done gently. Older children can be shown how to do it for themselves. Follow up the specific trigger point massage with a series of larger strokes going around the belly in a big clockwise direction. This will ensure that the “stuff” is moving in the right direction in your large intestine.

Psoas

The *psoas* (SO-az) muscles are properly called the *iliopsoas* (ILL-ee-oh-SO-az), because they include, as a branch, the *iliacus* (ill-ee-AH-cus) muscles that line the front of the hip bones. Your psoas muscles themselves lay buried behind your abdominal muscles and your intestines. They are considered to be part of the core muscles.

The psoas muscles attach to the bodies of the vertebrae, beginning at the level of your last rib and continuing down to the pelvis. Fascia connects the psoas with the iliacus in the groin, and then together they descend to attach to a bump on the inside of the top of the femur (the thighbone). This bump is called the *lesser trochanter* (tro-CAN-tur). The upper attachment of the iliacus is to the inner surface of the pelvis.

The primary action of the psoas is to flex the hip—that is, to raise your thigh toward your stomach or to bring it forward, as when you walk or run. The psoas muscles also play a large role in the opposite action of raising your

body to a sitting position when you're lying down. If these muscles are short and tight, they can create mechanical dysfunction in the lumbar spine and sacral iliac joint that contributes to various patterns of low back pain.

Trigger points in the psoas muscles are a common cause of pain in both the low back and thigh. They can also contribute to gynecological symptoms (Travell and Simons 1992; Dobrick 1989). Despite their seeming inaccessibility, psoas muscles are actually very easy to massage. If self-treatment of the psoas muscles had been taught in massage school, one woman could have saved herself and her clients much unnecessary misery.

Dawn, age thirty-nine, was a massage therapist and the owner of her own massage clinic, employing several other therapists. She also taught a daily aerobics class that included vigorous stair-climbing routines. To her great annoyance, the exercise that she depended on to maintain her health usually left her with low back pain. She also had pain and stiffness in her hips when she walked. She told a friend, a fellow therapist, about her concern. "I know it's classic repetitive strain, but no way am I going to give up aerobics. If I don't keep myself in shape, I balloon up like you wouldn't believe. I do lots of stretching, but it doesn't seem to be doing what it should."

During a massage, her friend discovered that Dawn's psoas muscles, which did so much of the work in the stair-climbing routines, were as hard as rock and extremely sensitive to touch. Pressure on the trigger points actually reproduced her pain. The friend showed her a technique for massaging her own psoas. Within days, the pain in her low back and hips was gone. She was able to help a client with a related problem right away.

Symptoms

Psoas trigger points refer pain to the low back on the same side of the body (figure 7.29). The pain pattern is distinguished by being oriented vertically, unless both psoas muscles are referring, in which case the verticality may not be so apparent. When the trigger points are really bad, back pain can extend from the lower shoulder blade area to the upper gluteal region (the upper part of the buttocks). Pain is worse when you're standing. Sit-ups become impossible and you may have difficulty getting up out of a chair. Severely troubled psoas muscles may prevent you from standing or walking at all, leaving you able to get around, literally, on only your hands and knees (Travell and Simons 1992).

A trigger point in the iliacus branch of the iliopsoas also refers pain to the back in the same pattern as shown in figure 7.29. A trigger point near the lower attachment refers pain to the groin, scrotum, and upper thigh (figure 7.30). A fourth trigger point is possible in the *psoas minor*, a muscle that is present in only about half the population. This small muscle is in front of the psoas major at the level of the belly button. You may not be able to distinguish one from the other by

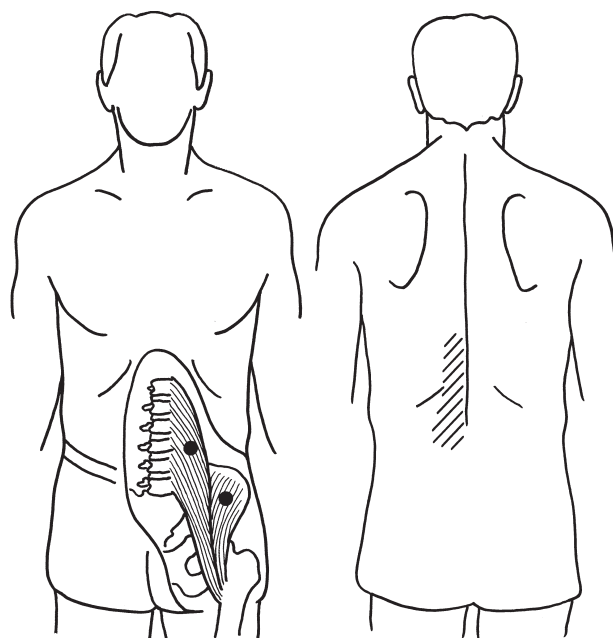


Figure 7.29 Psoas and iliacus trigger points and referred pain pattern in the back

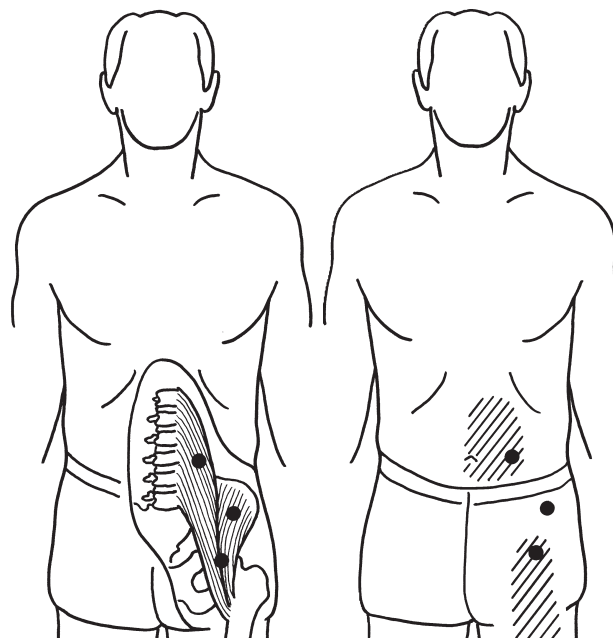


Figure 7.30 Psoas and iliacus trigger points and referred pain pattern in the abdomen, groin, and thigh

touch. Any of the trigger points in these areas can refer pain to the abdomen and genitals in both men and women (Travell and Simons 1992; Dobrick 1989).

Tight psoas minor muscles can tilt the pelvis backward, taking the curve out of the lower back. Conversely, a tight psoas major pulls the spine forward when in a standing position, giving an exaggerated curve to the lower back. The iliacus muscles, when shortened by trigger points, tilt the pelvis forward, as if you were sticking out your behind. It is possible for this pelvic tilt to happen on only one side, which can cause a strain to the sacroiliac joint on either side, resulting in very sharp debilitating pain. Both muscles tend to pull the midspine to one side when only the muscles on that side are affected and may be a significant cause of lateral scoliosis. The effects of psoas trigger points on the spine can be very serious. Shortened psoas muscles keep continuous pressure on the intervertebral disks in the lumbar region and may be at the heart of many otherwise unexplained disk and spinal problems (Travell and Simons 1992).

A stooped posture or habitual leaning to one side may indicate psoas trigger points. They can cause you to limp or walk splay-footed. If you have low back pain along with stiffness in your hips or groin in the morning and have trouble standing up straight, you are likely to find trigger points in your psoas muscles. When one of your hips seems to be positioned forward of the other, check for trigger points in the iliacus muscle on the inner surface of that hip (Travell and Simons 1992; Porterfield 1985).

Extending your leg behind you requires the psoas and iliacus to lengthen. This is what makes walking so difficult when trigger points afflict these muscles. Contraction of the psoas muscles also helps to rotate the legs outward, which will make you walk with your feet turned outward when psoas muscles are tight. Some of the gluteal muscles (in the buttocks) are the main muscles that have that effect, or what is called external rotation.

Causes

The psoas muscles can be overloaded in a fall, by strenuous running or climbing, or by any exercise that overworks the midsection. Sit-ups, leg-ups, or other abdominal exercise can be disastrous for psoas muscles already handicapped by trigger points. On the other hand, abdominal exercise can be greatly beneficial to both the psoas and abdominal muscles if you're scrupulous about keeping them free of trigger points.

Sitting for long periods of time, especially sitting with the knees up, is bad for the psoas and iliacus muscles because it keeps them shortened. Bucket seats in automobiles make a lot of trouble for these muscles. Truck drivers and people who travel long commutes to work are likely to have trigger points and low back pain from shortened hip flexors. A strained posture is another source of trouble with psoas muscles. An erect and balanced posture doesn't require any particular muscle or muscle group to work hard maintaining it. However, if you habitually stoop, lean, or slouch, some muscles will have to stay contracted continuously just to keep you from falling over.

Postural distortions caused by tight iliopsoas muscles also tend to overload the muscles of the neck and back, which have to stay tight to keep your head up and your eyes level. Any muscle that's overworked in this way is bound to develop trigger points. The cascade effect of one muscle promoting trigger points in another can eventually leave you with trigger points everywhere in your body.

Treatment

Primary psoas trigger points will be found deep in your abdomen about two inches to each side and an inch down from your belly button. On the front of your body, find the hipbone, or anterior superior iliac spine (or ASIS), at just about the level of your front pants' pocket, with one hand. With the other hand, find your belly button. The main trigger point will be halfway in between these two landmarks (figure 7.31). The fingers will work back-to-back, as shown in figure 7.26.

Get into position for psoas massage by lying on your back with your knees bent. Then let your knees fall over to the side away from the psoas muscle you want to work on. A thick pillow under the knees is helpful. This position will bring your hip up and allow your intestines to move out of the way a little bit (figure 7.32). This position,

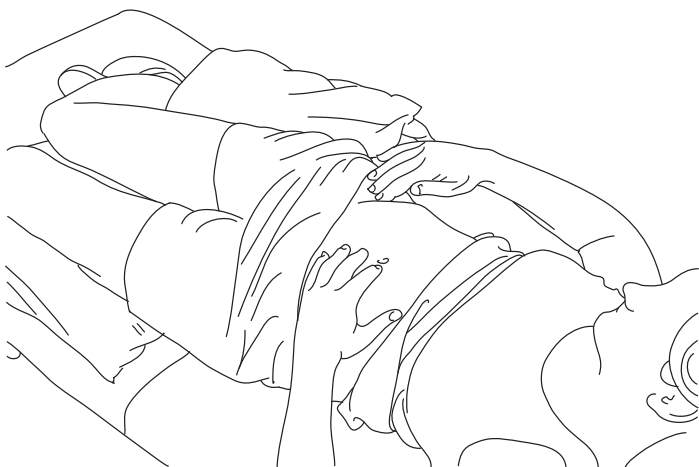


Figure 7.31 Finding the hip bone (ASIS) and belly button for psoas massage



Figure 7.32 Psoas massage with supported fingers back-to-back

with the knees to one side, is an excellent way to make all of the muscles on one side of the abdomen easier to massage. If this position hurts your back, don't do it. Instead, lie flat on your back with both knees resting on a pillow.

To confirm the placement of your fingers for psoas massage, raise your head for a moment to contract the rectus abdominis, the central slab of stomach muscle. Your fingers should be just off the outer edge of the rectus abdominis. Press deeply in and toward the spine. Feel for a rounded firmness running parallel to the rectus abdominis. A tense psoas will feel like a long, thin pepperoni or kielbasa sausage. If the muscle doesn't have trigger points, it will be soft and you may not be able to find it. To feel this muscle contract, flex the hip by bringing the knee slightly toward your opposite shoulder. It helps to have a little resistance on the thigh, either with your hand or someone else's.

Caution: Be aware of the descending aorta, which lies deep in the abdomen. If you feel a pulse while searching for the psoas, move slightly to the outside. If you feel a pulsing mass, stop the massage immediately and see a physician.

What is muscle pain, and what is coming from internal organs?

While lying down, press on the tender place, and then contract the abdominal muscles by raising your feet slightly off the bed. If the pain goes away while pressing, it is in the internal organs or intestines. If the pain stays the same or worsens, it is muscular.

Treatment Tips

Use a pillow or folded towels under your upper body and shoulders to make the arms reach longer down the abdomen.

If you encounter the heavy pulse of the descending aorta when working on your left psoas, just move a fraction of an inch away from the body's midline. The aorta is the body's largest artery and comes directly out of the heart. It's usually closer to the midline than either psoas muscle. You can do psoas massage safely without affecting the aorta. However, if you encounter a pulse on both the right and the left, can't seem to get off the pulse, or feel a pulsing mass, stop the massage immediately and see a physician. You may have an aortic aneurysm or life-threatening bulge of the descending aorta.

You will recognize the exquisite tenderness of trigger points in the psoas when you touch it. When they're bad, even light massage can be uncomfortable, but don't let the discomfort make you quit. You're the best one to do the work, because you have absolute control over the level of pain. Do a little bit of massage and come back to it repeatedly. Light massage is better than no massage.

You will have a better sense of the shape and location of the psoas if you stroke laterally across it (that is, from side to side). Once you're sure of where it is, you can massage the muscle lengthwise. Use a short, one-inch stroke, moving very slowly and moving the skin with your fingers. Use the fingers back-to-back to massage upward toward your head. Check for trigger points from just below

your lowest ribs all the way down to your groin. The worst point will be halfway between the belly button and the hip bone.

The iliacus portion of the iliopsoas may be just as important as the psoas muscle. Search the front side of the bowl-shaped pelvic bone with supported fingers pressing the muscle into the bone. To confirm you are on the iliacus, simply raise the leg and feel the muscle contract under the fingers. Some people also like the position of lying on their side to massage this muscle with the opposite thumb (figure 7.33). Massage any trigger points that you find with short, slow strokes.

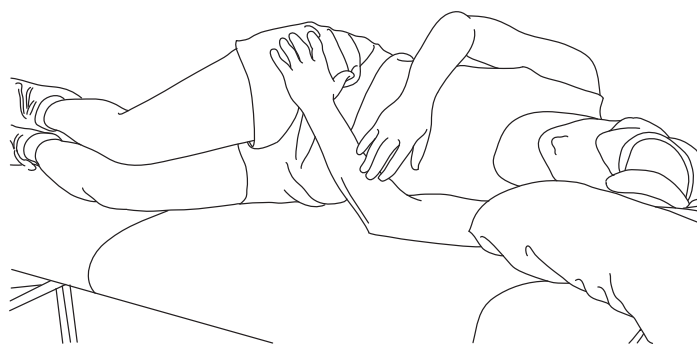


Figure 7.33 Iliacus massage with opposite thumb

Tenderness near the muscle attachment at the top of the thigh ordinarily doesn't need attention, because it can be expected to go away when you release the primary trigger points up near the belly button. If it does need treatment, lie down and look for this trigger point one inch below the *inguinal crease* (where the leg joins the body) and slightly to the inside of your thigh. The trigger point can be clear down at the bone. Be sure to stay off of the femoral artery; if you feel a pulse move to the outside.

After the psoas muscles are released, look for trigger points in the quadratus lumborum, rectus femoris, tensor fasciae latae, pectineus, gluteal muscles, and the hamstrings. You will find these muscles in chapters 8 and 9, or look them up on in the Quick Muscle Index on the last page of the book.

To prevent problems with your psoas muscles, be aware of your posture. Avoid sitting for long periods. Long-distance drivers or people who must sit all day at their jobs should take frequent breaks to stand up and walk around, giving their psoas muscles and other hip flexors a chance to lengthen. For sedentary people, this can't be done too often. Lunges are great once the trigger points are deactivated. Make massaging and stretching this muscle part of your life. Sleeping with your knees up in a fetal position keeps the psoas muscles in a shortened state all night long. Train yourself to sleep with your legs straighter. Sleeping with a pillow under your knees can also perpetuate trigger points in these muscles. Deactivate them first, then try to work your way free of this old habit.

Don't try to strengthen your midsection without first attending to all trigger points in the abdominal region. Overworking and overcontracting the iliopsoas muscles, in particular, when they're already in trouble can only make them worse. Exercise and stretching are both good ideas only when used at the appropriate time—after the trigger points are gone.

Pelvic Floor Muscles

Imagine the abdominal cavity being a tall cylinder with the diaphragm as the top, the deepest layer of abdominal obliques being the sides, and the pelvic floor being the bottom. The pelvic floor muscles have many jobs including urinary and fecal continence, support of the bladder and uterus, spinal stability, sexual function, and breathing (Jones 2012). This area of the body is fairly complex, and authors vary on the specifics of the names and descriptions of these muscles. In general, the *pelvic floor muscles* can be divided into two groups: the superficial muscles, or “urogenital diaphragm,” which include the most external muscles, and the *perineum* (peh-rih-NEE-um) (soft tissue area between the anus and the vagina or penis), and the deep muscles, also referred to as the “pelvic diaphragm.”

The most external layer of the urogenital diaphragm is made up of the *bulbospongiosus* (also called bulbocavernosus) and *ischiocavernosus* muscles, which primarily have a sexual function. In females, the bulbospongiosus surrounds the orifice of the vagina and attaches to tissues surrounding the clitoris and the anus. It constricts the vagina and contributes to the erection of the clitoris. The ischiocavernosus, also called the “erector clitoris,” covers the unattached surface of the clitoris. In males, the bulbospongiosus covers the body of the perineum posteriorly

and anteriorly surrounds the base of the penis. The ischiocavernosus muscle, also called the “erector penis,” covers the outermost sides of the perineum to the penis. The perineum is made up of muscle fibers from the surrounding muscle including the rectum and anal sphincters, levator ani, bulbospongiosis, and ischiocavernosus (Jones 2012).

The pelvic diaphragm is primarily made up of a group of muscles collectively called the *levator ani*, which is divided into two main parts. Starting at the front of the pubic bone, the U-shaped part that surrounds the urethra, vagina, and rectum is called the pubovisceral muscle. Just behind and to the outside of the pubovisceral muscles is the *iliococcygeal*, which attaches the inside of the pelvis on both sides by way of the fascia covering the perineum and urogenital diaphragm. In both sexes, the levator ani supports the pelvic organs and assists the anal and urethral sphincters. Additionally, it helps to constrict the vagina. Another muscle, the *ischiococcygeus* (or *coccygeus*), makes up the most posterior part of the pelvic diaphragm. It attaches to the sacrum, coccyx, and pelvis. In addition to supporting the pelvic organs, it pulls the coccyx forward and stabilizes and rotates the sacroiliac joint (Jones 2012).

There are also muscles considered inner pelvic wall muscles—the *obturator internus* and the *piriformis*. In both sexes, the obturator internus attaches the greater trochanter of the femur to the internal surface of the pelvic bone. It laterally rotates the thigh when the thigh is extended (turns the leg outward when the leg is straight at the hip) and abducts the hip when the thigh is flexed (moves the leg away from the midline when sitting). The piriformis attaches the greater trochanter of the femur to the anterior surface of the sacrum. It does lateral rotation of the thigh, abduction of the hip when the thigh is flexed, and contralateral rotation of the pelvis.

Symptoms

Pain from the pelvic floor muscles is referred to the vagina, vulva, penis, testicles, perineum, bladder, urethra, very low back, anus, rectum, sacrum, and tailbone, and high on the backs of the thighs. Urinary incontinence can be a result of hypotonic (flaccid) or hypertonic (tight) muscles and trigger points. A fullness or heavy feeling in the rectal area or prostate is a common symptom. In women, trigger points can contribute to menstrual pain and pain during sexual intercourse. In men, they can contribute to prostate problems, pain during ejaculation, and impotence. Common diagnoses include levator ani syndrome, interstitial (nonbacterial) cystitis, vulvar vestibulitis, dyspareunia (pain during intercourse), coccygodynia, vulvadynia, proctalgia fugax, and tension myalgia of the pelvic floor (Travell and Simons 1992; Chaitow 2006).

You don't have to make the assumption that pelvic floor trigger points are the cause of your problem. It is very likely that they are satellite trigger points from external muscles. The abdominal obliques, rectus abdominis, adductor magnus, piriformis, gluteus medius, gluteus maximus, and psoas may all need to be treated first (Travel and Simons 1992; FitzGerald, et al. 2009). If symptoms continue after trigger points have been deactivated and range of motion has been restored to these muscles, consider exploring the pelvic floor muscles externally first, then internally. Long-term relief may depend on treating from the outside in (Deborah Brodzik, PT, personal communication with the author, 2012).

Trigger points in both of the most superficial muscles of the urogenital diaphragm, the bulbospongiosis and ischiocavernosus, can cause pain in the perineum, vagina, penis, testicles, and scrotum. The bulbospongiosis can also cause vaginal pain during intercourse, pain during ejaculation, and impotence. The deeper layer of pelvic floor muscles, the levator ani, can cause pain in the vagina, perineum, rectum, anus, sacrum, and tailbone. A sense of rectal fullness or urinary stress incontinence is also possible. Painful actions include sitting, lying flat on your back, and bowel movements. Muscles in the anal sphincter can also be involved in rectal and tailbone symptoms (Travell and Simons 1992). Tight coccygeus muscles are capable of pulling the tailbone (coccyx) and sacrum out of position, resulting in pain in the low back, hip, sacroiliac joint, and tailbone. Osteopaths, chiropractors, physical therapists, and some massage therapists are trained to reset the sacral iliac joints, which may be needed even after trigger point treatment. Coccyx, or tailbone, pain can be caused by trigger points in the gluteus maximus or multifidi muscles. Obturator internus trigger points can cause rectal pain and fullness as well as tailbone and vaginal pain. The piriformis can also contribute to rectal pain and fullness as well as impotence and perineum pain (Travell and Simons 1992; Kidd 1988).

Causes

Bad falls, auto accidents, pelvic surgery, hysterectomies, pregnancy, emotional tension, and childbirth can create trigger points in the pelvic floor muscles. Other conditions that promote pelvic floor trigger points are chronic pelvic infections, endometritis, intrapelvic cysts, fibroids, surgical scarring, and hemorrhoids (Travell and Simons 1992; Lilius and Valtonen 1973).

Overtoneing the pelvic floor through various exercises that focus on strengthening the core without a balance of flexibility can be particularly troublesome. In his article “The Pelvic Floor Paradox,” osteopathic physician Leon Chaitow describes seeing a correlation between women who had a history of dance, gymnastics, athletics, and chronic pelvic pain. Many of these patients had a common history of practicing Pilates. Many women are prescribed Kegel exercises (drawing up the pelvic floor) in the mistaken assumption that their stress incontinence is due to weak pelvic floor muscles when quite often the opposite is the case. Hypertonic (tight) pelvic floor muscles can react to further contraction by suddenly retracting and letting go, thus causing incontinence. It is normal to draw up the pelvic floor in response to the “need to go,” sneezing, coughing, laughing, or exertion. These are the times when stress incontinence happens. The entire problem may be treatable with massage. Traumatic or intense sexual activity can set up trigger points in muscles inside the pelvis that are specifically associated with the action and function of the genitals (Travell and Simons 1992; Chaitow 2006).

Habitually slouching down in chairs to sit on the end of your spine promotes trouble in the pelvic floor muscles. Pressure imposed on that area strains the many muscles that attach to the underside of the tailbone. Children as well as adults can have pain in the pelvic area caused solely by habitually sitting back on the tailbone. Avoid slouching and perhaps sit on a towel roll that forces you to sit forward on your sit bones, or ischial tuberosities. Heavy lifting is also a danger to these muscles. It’s well-known that lifting is one of the things that cause hemorrhoids. The same forces strain the muscles of the pelvic floor and can be the primary cause of trigger points in them. Use good lifting techniques by using the legs, and avoid holding your breath while lifting heavy objects. Good breathing techniques and conscious relaxation of the pelvic floor during lifting and other stressful or vigorous activity will help to avoid stress of the pelvic floor (Marmor, personal communication with author, 2012). Read chapter 12, *Muscle Tension and Chronic Pain*, for help with relaxation.

Treatment

Before working the pelvic floor muscles, fully treat all of the other possible muscles listed in the symptoms section. A gentle way to massage and slowly stretch hypersensitive external fascia and muscles of the superficial pelvis is to apply pressure with a clean, dry tampon. After the initial burning sensation eases, keep working progressively deeper until all of the hypersensitivity and pain are gone. This may take many sessions, as the sensitivity is caused by the layers of tissue not moving (Deborah Brodzik, PT, personal communication with the author, 2012). The next step is to massage the deeper pelvic diaphragm muscles by sitting on a soft inflatable ball such as a Fit or Yamana ball, or a ball like the ones used in yoga or Pilates. While seated in a chair or on the floor, start with a seven- or nine-inch ball and work your way down to a five-inch ball. When this is no longer painful, try a sponge ball like the High Bounce Pinky or a tennis ball. Eventually, you may need a 45 mm rubber ball or rubber dog toy that looks like a tennis ball. Go easy at first. Start at the perineum (the area between the anus and the genitals) and allow yourself to ease into the pressure. Relax the pelvic floor over the course of a few minutes. Don’t allow any discomfort to become pain (Chaitow and Jones 2012). Then, using your arms for support, slowly search around the entire pelvic floor, from left to right and front to back, for areas of tenderness. Be careful to avoid putting deep pressure directly on the tailbone (coccyx), as it is not made to bear the weight of the body. Give each point of tenderness a little massage lasting no more than a minute. Be sure to read chapter 3, *Treatment Guidelines*, for general massage instructions.

Once the accessible muscles are free of trigger points, you may need to search internally for additional points. Before exploring for internal trigger points, it would be wise to make sure your doctor or gynecologist agrees that it would be okay for your body. Try sitting on a toilet or squatting on a carpeted surface to best access these muscles

either vaginally or anally. To apply gentle pressure, use your thumb, fingers, a specialized personal item made for this area, or a therapy tool called a “dilator,” which can be purchased through a medical supply store. Bearing down will relax the anal sphincter muscles enough for easier insertion of a lubricated, gloved finger or instrument.

Apply pressure forward, to the sides and back toward the tailbone while searching for trigger points. You may also find points by pinching the tissue between your thumb internally and finger externally. Hemorrhoids or trigger points themselves can make this painful, but any little bit you can do will be of benefit. Be patient, gentle, and persistent. As the trigger points get better, the massage will get easier. By now, after working on other parts of the body, you should be able to recognize the characteristic exquisite tenderness of a myofascial trigger point. If a tender trigger point reproduces your symptom when you press it, then you know you’ve found the source of your problem (Travell and Simons 1992).

For muscles deeper inside the pelvis, you will need help, and you may want to seek out an experienced professional. Otherwise, an adventurous, intelligent, gentle partner may be able to do you some good, particularly if this person has taken the trouble to develop some sensitivity through self-treatment of his or her own myofascial problems.

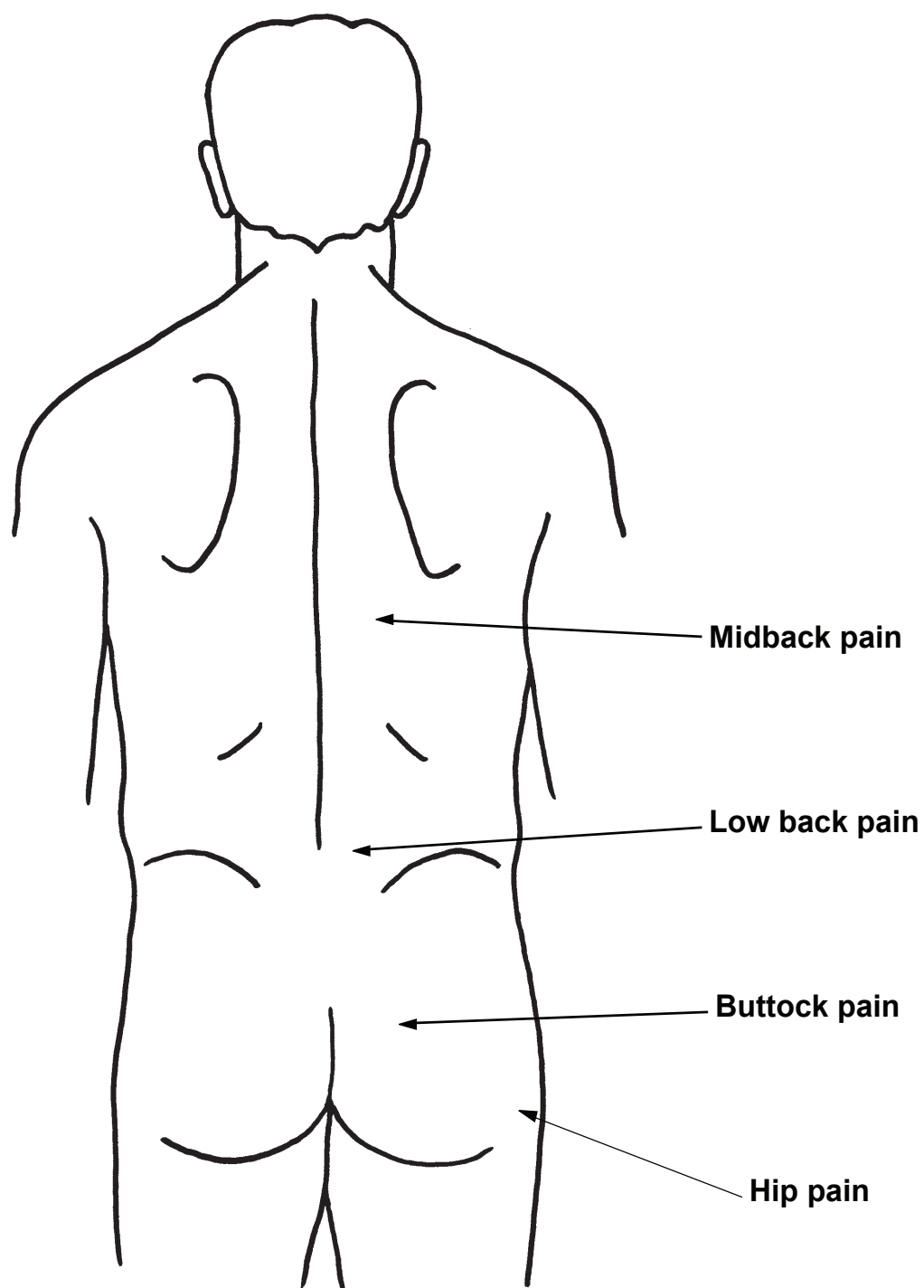
It may not be advisable to massage the pelvic floor muscles late in pregnancy, even externally; that is a question for your obstetrician or midwife. Some women have found it beneficial to prepare the pelvic floor by clearing these muscles of trigger points well in advance of pregnancy and during early pregnancy. Myofascial pain may continue to be a problem postpartum when trigger point therapy would be appropriate. Wait until your doctor says it is okay to return to normal sexual activity before self-treating these muscles.

Massage of muscles deep inside the pelvis is described in detail by Travell and Simons (1992) in volume 2 of *Myofascial Pain and Dysfunction*. There is a specialty of physical therapy that focuses on chronic pelvic pain and studies Travell’s techniques as well as others’. These exceptional therapists are trained to treat external and internal trigger points. Often, easily accessible muscles are responsible for creating satellite trigger points internally. When internal massage is needed, nothing else will do. You may be able to treat the pelvic floor muscles yourself, but if you need more help, see the Resources section in the back of the book for information on finding a physical therapist who specializes in chronic pelvic pain.

It is very helpful to keep a journal of what you have tried and the progress you have made. Everyone forgets how bad it really was at the beginning. It can be very reassuring to go back and read about the gains you have made.

Chapter 8

Midback, Low Back, and Buttock Pain



Pain Guide

Midback, Low Back, and Buttock

Boldface type indicates a primary pain pattern. Regular type refers to a less common or satellite trigger point pattern. Muscles are listed in the order of how likely they are to be the problem. *Also see Other Symptoms Guide.* We've made these guides available for download at www.newharbinger.com/24946. See the back of the book for more information.

Buttock

gluteus medius (204)
quadratus lumborum (198)
gluteus maximus (201)
 superficial spinal muscles (195)
 semitendinosus (241)
 semimembranosus (241)
 piriformis (182)
 gluteus minimus (207)
 rectus abdominis (172)
 soleus (270)

Coccyx (tailbone)

pelvic floor muscles (levator ani, coccygeus) (182)
gluteus maximus (201)
 deep spinal muscles (192)

Hip

gluteus minimus (207)
 vastus lateralis (229)
 piriformis (182)
quadratus lumborum (198)
 tensor fasciae latae (220)
 adductor longus and brevis (234)
gluteus maximus (201)
 rectus femoris (225)

Low Back

gluteus medius (204)
 psoas/iliacus (177)
 deep spinal muscles (192)
 superficial spinal muscles (195)
quadratus lumborum (198)
gluteus maximus (201)
 rectus abdominis (172)
 soleus (270)
 pelvic floor muscles (181)

Midback

superficial spinal muscles (195)
 deep spinal muscles (192)
serratus posterior inferior (198)
 rectus abdominis (172)
 intercostals (195)
 latissimus dorsi (117)
 serratus anterior (169)

Sacrum

pelvic floor muscles (181)
gluteus medius (204)
quadratus lumborum (198)
gluteus maximus (201)
 deep spinal muscles (192)
 rectus abdominis (172)
 soleus (270)

Other Symptoms Guide

Midback, Low Back, and Buttocks

Leg-Length Inequality (mechanical, not structural)

Anterior Pelvic Tilt

- iliacus (177)
- tensor fasciae latae (220)
- rectus femoris (225)
- gluteus medius (204)
- adductor longus (234)

Pelvic Upslip

- quadratus lumborum (198)
- superficial spinal muscles (195)

Posterior Pelvic Tilt

- semimembranosus (241)
- semitendinosus (241)
- biceps femoris (120)
- rectus abdominis (172)
- adductor magnus (236)

Pain or Trouble with Motion

Coughing or Sneezing

- rectus abdominis (172)
- quadratus lumborum (198)
- serratus posterior inferior (198)

Forced to Crawl on All Fours

- quadratus lumborum (198)
- psoas/iliacus (177)

Forward Flexion (bending)

- superficial spinal (195)
- quadratus lumborum (198)
- deep spinal muscles (192)

Going Down Stairs or Hills

- soleus (270)

Going Up Stairs or Hills

- superficial spinal muscles (195)
- gluteus maximus (201)
- quadratus lumborum (198)

Hypersensitivity to Touch

- superficial spinal muscles (195)

Lifting

- quadratus lumborum (198)

Lying Down on Your Back

- gluteus medius (204)

Lying Down on Your Side

- quadratus lumborum (198)
- gluteus minimus (207)
- gluteus medius (204)
- piriformis (182)

Rising from a Low Chair or Car Seat

- superficial spinal muscles (195)
- gluteus minimus (207)
- gluteus maximus (201)
- quadratus lumborum (198)
- psoas/iliacus (177)
- piriformis (182)
- semimembranosus (241)
- semitendinosus (241)

Side Bending

- quadratus lumborum (198)
- superficial spinal muscles (195)
- abdominal obliques (172)
- deep spinal muscles (192)

Sitting

- quadratus lumborum (198)
- piriformis (182)
- gluteus maximus (201)
- gluteus medius (204)
- semimembranosus (241)
- semitendinosus (241)
- pelvic floor (162)
- intrapelvic (181)

Sit-Ups

- psoas/iliacus (177)

Standing

- psoas/iliacus (177)
- quadratus lumborum (198)
- gluteus minimus (207)
- piriformis (182)

Standing and Leaning Forward

- quadratus lumborum (198)
- superficial spinal muscles (195)

Swayback (exaggerated lumbar curve)

- psoas (177)

Swimming

- gluteus maximus (201)

Turning Over in Bed

- quadratus lumborum (198)
- gluteus minimus (207)

Twisting (rotation)

- quadratus lumborum (198)
- superficial spinal muscles (195)
- deep spinal muscles (192)

Upon Rising from Sitting or

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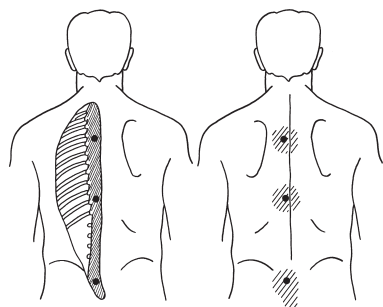
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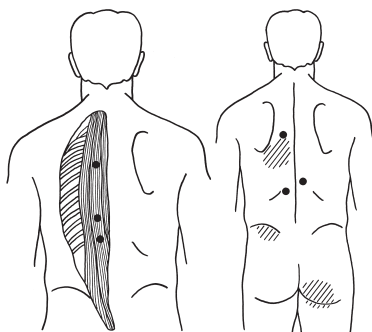
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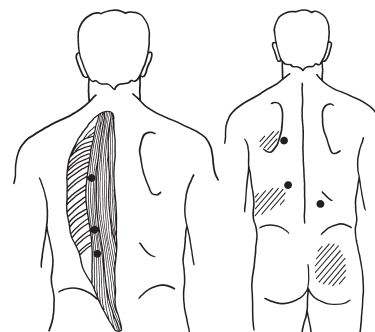
Midback, Low Back, and Buttocks



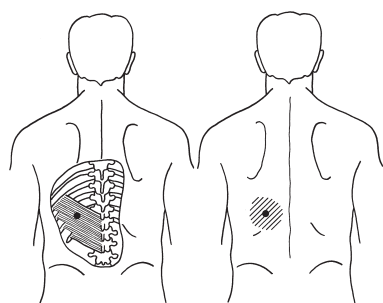
Deep spinal muscles; examples of trigger points and pain patterns. Trigger points can occur anywhere along the spine. (p. 192)



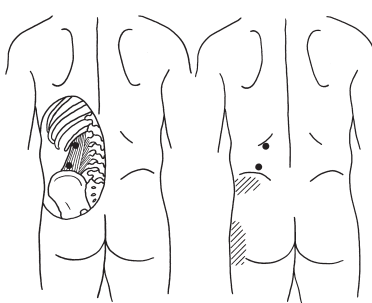
Longissimus trigger points and referred pain pattern. All three points occur on both sides. (p. 195)



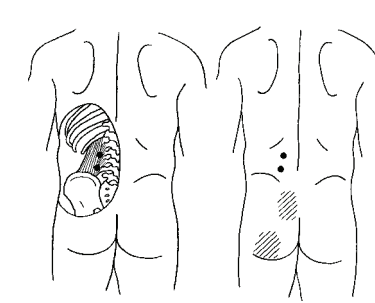
Iliocostalis trigger points and referred pain pattern. All three points occur on both sides. (p. 195)



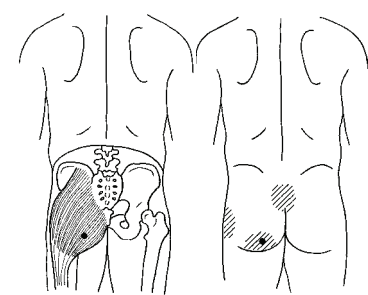
Serratus posterior inferior trigger point and referred pain pattern (p. 198)



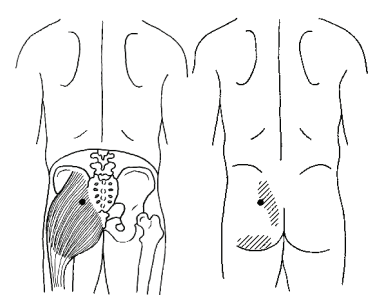
Quadratus lumborum superficial trigger points and referred pain pattern (p. 199)



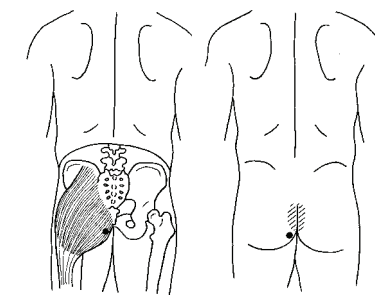
Quadratus lumborum deep trigger points and referred pain pattern. These points are hidden underneath the superficial spinal muscles. (p. 199)



Gluteus maximus number 1 trigger point and referred pain pattern (p. 202)

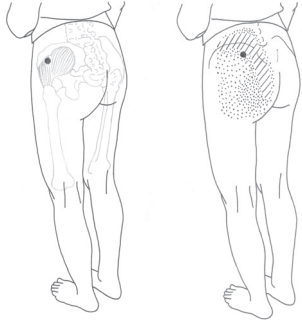


Gluteus maximus number 2 trigger point and referred pain pattern (p. 202)

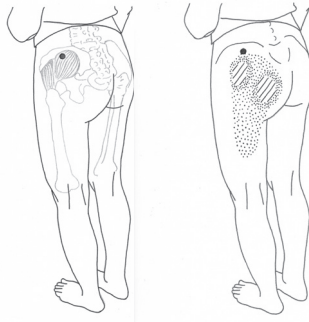


Gluteus maximus number 3 trigger point and referred pain pattern (p. 202)

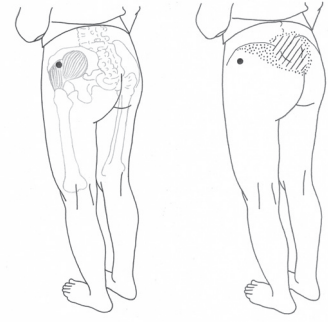
We've made this guide available for download at www.newharbinger.com/24946. See back of book for more details.
 Caution: Please read the full treatment instructions for each muscle before beginning.



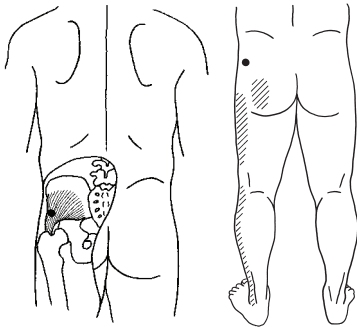
Gluteus medius number 1 trigger point and referred pain pattern (p. 204)



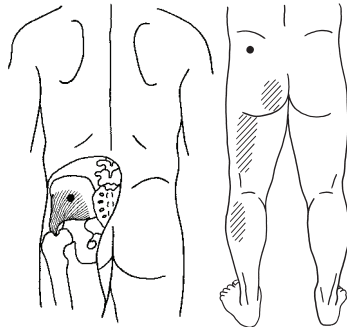
Gluteus medius number 2 trigger point and referred pain pattern (p. 204)



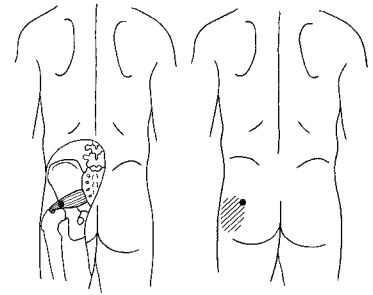
Gluteus medius number 3 trigger point and referred pain pattern (p. 204)



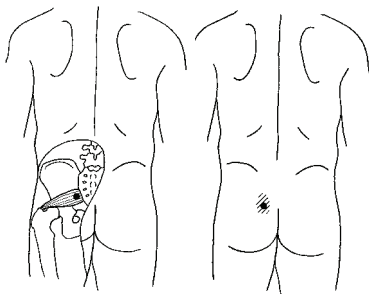
Gluteus minimus number 1 trigger point and referred pain pattern (p. 207)



Gluteus minimus number 2 trigger point and referred pain pattern (p. 207)



Piriformis number 1 trigger point and referred pain pattern (p. 209)



Piriformis number 2 trigger point and referred pain pattern (p. 209)

Midback, Low Back, and Buttock Pain

The solution for your back pain may be simpler than you think. Many people are haunted by the fear that pinched nerves, ruptured disks, or arthritis is causing their back pain, when there's a good chance that their pain may be coming solely, or at least in part, from myofascial trigger points in muscles. Even when back pain is due to genuine problems in the vertebral column, myofascial trigger points often contribute a major part of the pain. In fact, there's reason to believe that trigger points can be the root cause of many spinal problems because of the muscle tension they maintain. Short, tight muscles can displace vertebrae and cause compression of nerves and disks. When investigating back pain, trigger points should be at the top of the list, because trigger point therapy is noninvasive, has few side effects, and can be done on yourself (Travell and Simons 1992).

The reason there are so many differing opinions about the cause of back pain is that so often referred pain is involved. This is especially true of low back pain. You may never find the real cause of low back pain if you look for it only in the low back. Surprisingly, trigger points in the buttocks muscles are a frequent cause of low back pain. The reverse is also true: trigger points in the low back often refer pain down to the buttocks and hips. In addition, trigger points in the abdominal and psoas muscles can send pain to the back, though they're easily overlooked, even by people who know trigger points well. For pain in the back and buttocks, this simple rule applies: it's a mistake to assume the problem is in the place that hurts!

It's a mistake to assume the problem is in the place that hurts!

Confusing the issue further, back pain is usually a composite, with components sent from trigger points both above and below where you feel the pain. The key to success in self-treating back and buttock pain lies in your troubleshooting skills. The Other Symptoms Guide and Pain Guide for this chapter are vital for tracking the various components of your pain.

Sacral iliac (SI) joint dysfunction can come from and create satellite trigger points in a number of muscles including the psoas, iliacus, quadratus lumborum, gluteus maximus, gluteus medius, gluteus minimus, and superficial spinal muscles. Pain may be sudden or gradual at the side of the sacrum where it encounters the pelvic bone. Simple combinations of motions that include bending and twisting like shoveling snow, getting up off a low chair, or stooping then bending sideways to pick something up off of the floor can cause displacement of the SI joint (Travell and Simons 1992). If the pain is deep and achy at the SI joint, it is likely to simply be trigger points. If the pain is severe and disabling, massage the muscles listed above. If it's not a lot better in a day or two then see a chiropractor or osteopathic physician to adjust the sacrum back into place.

To prevent back problems, do something to strengthen your abdominal and core muscles so that your back muscles don't have to do all the work when you bend and twist and move about. Just remember to be sure your abdominal trigger points are under control before exercising your midsection, or you'll make more trouble for yourself than you already have. Read the sections "Causes of Trigger Points" and "Trigger Point Perpetuators" in chapter 2 to learn about ways to reduce other factors that may be causing your pain.

Deep Spinal Muscles

The many kinds of muscles associated with the spine make a confusing array, but it helps to think of them as belonging to two groups: the outer layers and the inner layers. The outer layers are the superficial spinal muscles, which are long muscles running parallel to the spine. The inner layers are the deep spinal muscles, which are very short muscles oriented diagonally to the spine to gain leverage on individual vertebrae (figure 8.1).

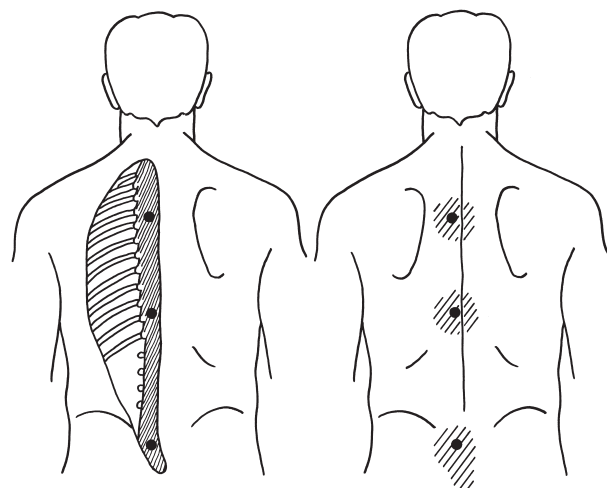


Figure 8.1 Deep spinal muscles; examples of trigger points and pain patterns. Trigger points and pain can occur anywhere along the spine.

The names of the various deep spinal muscles are the *semispinalis*, *multifidi*, *rotatores*, and *levator costae*. The last group, the levator costae, attaches the vertebrae to the ribs. The others all attach the vertebrae to one another at successively deeper levels (figure 8.2). Their angular arrangement gives them good leverage for twisting and side bending the spine. When the deep spinal muscles all work together, they help extend the spine, like when you straighten back up after bending over.

Symptoms

Pain from trigger points in the deep spinal muscles may feel like deep achy pain in the spine itself, as shown in figure 8.1. Trigger points in the thin multifidi muscles that cover the sacrum at the base of the spine cause sharp pain in the low back. This is one of the few examples of trigger points that cause pain right at the site rather than referring it away. This is because the tension in these small diagonal muscles tends to pull one or more vertebrae out of line to one side. When vertebrae are not perfectly seated together, they can put pressure on the nerves, which will send out pain signals of their own, adding to the pain from the muscles.

Please note, the illustration shows only representative trigger points. They can occur all the way up and down the spine on either side of the vertebrae. The pain is always at the same place. Trouble with the deep spinal muscles and their associated vertebrae can be quite disabling, restricting all motions of bending or twisting—front, back, or sideways. Your back typically feels as stiff as a board. Turning your body becomes difficult (Travell and Simons 1992).

Trigger points in the deep spinal muscles of your lower back can send pain forward to the abdomen and downward into the buttocks. Your tailbone can be quite tender because of referred pain; this condition is often called *coccygodynia*. When a chiropractic treatment does not address the muscles specifically, the vertebrae can be pulled right back out of place again. When trigger points are deactivated directly with deep massage, clients may feel vertebrae popping back into place on their own (Travell and Simons 1992). Chiropractic care and massage therapy often work well together. You are likely to find that chiropractic adjustments hold longer when combined with trigger point massage.

Extreme tension in the deep spinal muscles can entrap the nerve root as it exits the spine. Ruptured intervertebral disks can also pinch the nerves, causing a condition called *radiculopathy*, which makes neurological deficits including numbness, reduced tendon reflexes, and significant weakness with atrophy. In either case, a pinched motor nerve will create trigger points in the muscles it supplies farther down the nerve's path. These satellite trigger points will be especially tender, almost untouchable, and won't respond well to treatment. So how do you know if the problem is coming from the muscle tension at the spine? If a deep spinal muscle is causing the pinched nerve, the muscle will be tight and tender to the touch. A few treatments will improve all of the symptoms. If the problem is coming from the spine itself, there will be little relief with detailed trigger point massage. If physicians had a good understanding of the myofascial source of back pain, it could make many back operations unnecessary (Travell and Simons 1992).

Osteoarthritis is given the credit for much back pain, especially when it shows up on X-rays. The problem with a medical diagnosis of arthritis is that it shuts off all further inquiry and leaves you with painkillers as your only solution—and they are a poor solution to pain when trigger points are the cause. It is very possible for chronic back pain to be banished by trigger point therapy, even in the presence of true arthritis. It's a fact that osteoarthritis doesn't always cause pain. Active trigger points always do (Travell and Simons 1992; Crow and Brodgon 1959).

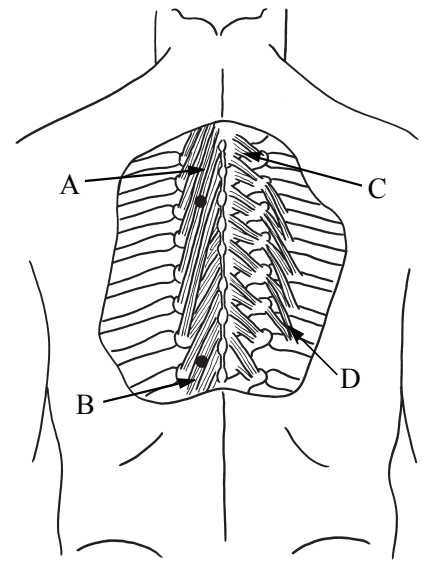


Figure 8.2 (A) semispinalis, (B) multifidi, (C) rotatores, (D) levator costae

Causes

Valerie, age twenty-six, was addicted to her new computer, and it had given her a terrible pain in the middle of her back, just to the left of her spine. The pain was constant but became worse when she moved. Sleep made it go away but only temporarily.

Upon deeper investigation, it wasn't the computer that hurt Val's back. She revealed that she had been sitting sideways at the computer with her body twisted so she could reach the keys. She did this so her cat could be on her lap and not pester her for attention while Val was occupied by what was on the screen. Staying in this twisted posture for hours at a time kept her deep spinal muscles continuously contracted, a sure road to muscle exhaustion and trigger points. Val got rid of the trigger points with her Thera Cane. She also stopped sitting sideways at the computer. She said the cat was annoyed, but not enough to make her leave home.

Maintaining any twisted or unbalanced position like Valerie did at her new computer can leave you open to trouble, but there are many less obvious causes. Weak abdominal muscles can cause an unnecessary load on the back muscles, which may have to work beyond their endurance to compensate. This is why unaccustomed yard work or horsing around with the kids can throw your back out. The deep spinal muscles, being individually quite small, are particularly vulnerable to sudden overload, repetitive motion, or poorly coordinated movement. It's even worse for them when you're cold, tired, or not in good condition in the first place.

It's interesting that the only time the deep spinal muscles are relaxed, except when you're lying down, is when you're standing perfectly upright with your weight evenly distributed on all sides of your spinal column. The deep spinal muscles are severely overtaxed by slouching. These small muscles must work continuously when you habitually stand or sit with your shoulders hunched, your back rounded, and your head thrust forward. It is worth it to continue to work on your posture by massaging the tight, short muscles on the front of your body that pull you forward and down. The abdominal, chest, and front of the neck muscles are often responsible for poor posture.

Treatment

Trigger points in the deep spinal muscles lie very close to the spine (figures 8.1 and 8.2). They're found in the shallow trough called the *lamina groove* between the spine and the long vertical mound of muscle on either side. These long mounds are the superficial spinal muscles, which will be discussed in detail in the next section. Skip ahead to figures 8.4 and 8.5 and take a glance at them. You'll see that each mound is made up of three parallel segmented strips of muscle. The innermost, thinnest strip covers the deep spinal muscles. The second strip covers them too, where it begins to broaden in the lower half of the spine.

A tennis, high bounce, or lacrosse ball against a wall is generally a good tool for massage of the back, but it may be too large to penetrate to the deep spinal muscles unless you lie on it. If you do the massage in bed, put a large paperback book under the ball to keep it from burying in the mattress, or simply do the massage on the floor. Using a ball against a wall gives you more freedom to maneuver, but the ball may need to be smaller and harder than a tennis ball to penetrate deep enough. Deep massage right beside the spine with a 35 mm high bounce rubber ball is very effective. The 35 mm ball is slightly smaller than a golf ball and is the preferred tool for the bottom of the feet. It can usually be found wherever toys are sold or in gum-ball machines.

While leaning against the wall, roll the ball up and down right beside the spine. Sometimes it feels good to do a tiny stroke sideways. Think of it more as gently pressing away from the spine but not yet bumping across onto

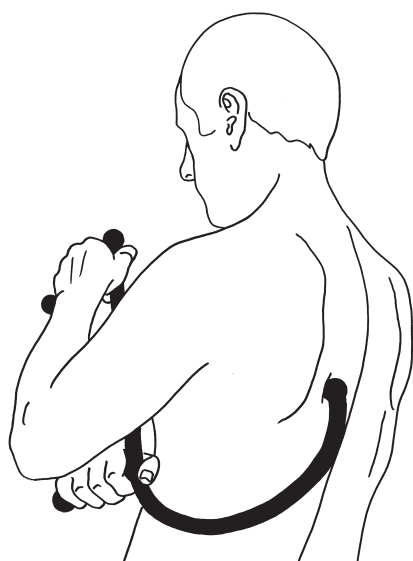


Figure 8.3 Massage of deep spinal muscles with Thera Cane (or use a 35 mm high bounce ball against a wall)

the thick superficial spinal muscles. Some people find the Thera Cane or Backnobber effective (figure 8.3). You may have to lie down flat on your back with it, however, and lever it against the bed underneath you to get the penetration you need. Make the stroke in any direction that seems easiest and most ergonomically efficient. Read chapter 3, Treatment Guidelines, for more information on how to massage trigger points.

Superficial Spinal Muscles

Read chapter 3, Treatment Guidelines, for more information on how to massage trigger points.

There are three long, superficial muscles on each side of the spine: the *longissimus* (long- GHIIH-sih-mus), the *iliocostalis* (ILL-ee-oh-kuh-STAH-iss), and the *spinalis* (spin-AH-liss) (figures 8.4 and 8.5). They make up the long vertical segmented groups of muscle that run down between the shoulder blades and the spine. They're thicker in the low back and get progressively thinner as they move up past the shoulder blades. The word “superficial” tells you that they are closer to the surface, covering the deep spinal muscles. They are also called the *erector spinae*, or spinal erector muscles.

At their upper ends, the longissimus muscle attaches to the ribs and the *transverse processes* (small outer projections) of the vertebrae. This is the one you will feel as a large bulky band of muscle starting one-half to one inch away from the spine. The iliocostalis is usually a broad flatter muscle that lies about two to three inches away from the spine. The upper ends of the iliocostalis muscles attach only to the ribs. The lower ends of both muscles attach to the sacrum, the large broad bone at the base of the spine. The spinalis muscles, running right along the spine, attach vertebrae to vertebrae. They're present only in the middle of the back.

The superficial spinal muscles do extension (straightening up from being bent forward all the way to doing a back bend) and side bending of the trunk. They help with exhalation, bowel movements, coughing, and sneezing. They also function to checkrein the body by eccentrically contracting (or contracting and lengthening at the same time) when you bend forward or to one side. They participate in keeping the body upright and balanced. Like the deep spinal muscles, these long muscles of the spine can be quite relaxed when you're standing still if the body is well centered.

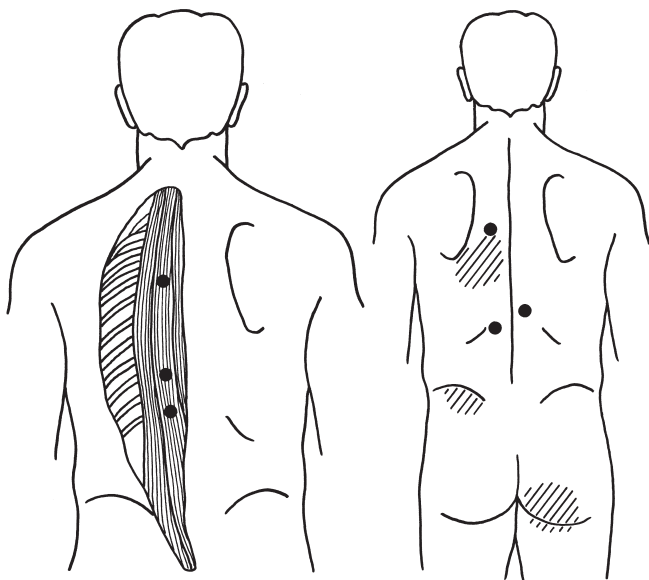


Figure 8.4 Longissimus trigger points and referred pain pattern. All three points occur on both sides.

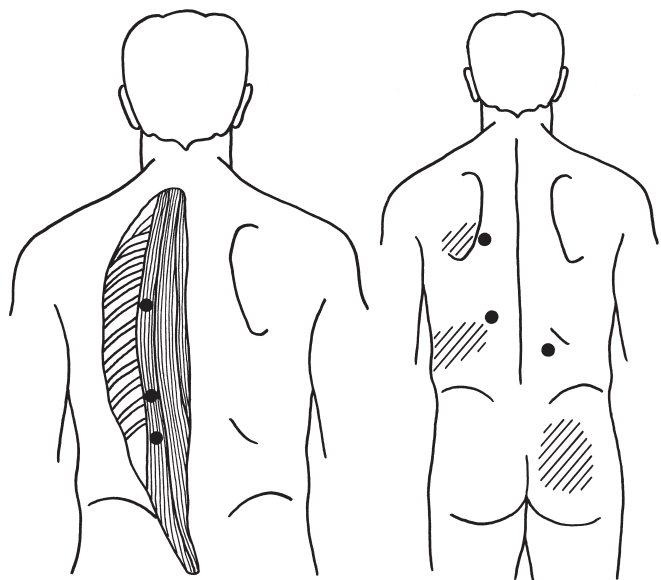


Figure 8.5 Iliocostalis trigger points and referred pain pattern. All three points occur on both sides.

Symptoms

In addition to pain, trigger points cause tightening of the superficial spinal muscles over their entire length. There are six trigger points that refer six different pain patterns. It is also possible to have hypersensitive knots all up and down these muscles. Researchers have not yet identified additional pain patterns with these other points. The six identified trigger points can be the primary cause of problems in the superficial spinal muscles, but it is often useful to treat the whole muscle group when there is pain in the back. Rick's story is an illustration of how misleading a back problem can be.

Rick, age thirty-four, was a muscular power-company lineman who suffered pain and tightness over the entire length of his back, from his tailbone to the base of his skull. He was conscious of his aching back even when asleep. His insurance had paid for CT scans, MRIs, X-rays, and many visits to two different chiropractors, but there had been minimal improvement and no definitive diagnosis. In the meantime, he'd been instructed to exercise and stretch. "I keep doing the stretching," he said, "but it never does any good. My back's so stiff I feel like an old man. It makes me afraid to move."

Rick's superficial spinal muscles were like wooden posts, and trigger points were found in several places along them on both sides. Trigger point therapy gave him great relief. A month of working on himself with a tennis ball against a wall erased most of Rick's pain. He soon felt loose enough to profit from the stretching exercises that had been prescribed.

Trigger points in the superficial spinal muscles usually cause a more diffuse kind of pain than trigger points in the deep spinal muscles. The deep spinals cause pain right around the trigger point. Trigger points in the longissimus and the spinalis are found within a couple inches of the spine and send their pain generally downward to the low back and buttocks (figure 8.4). Iliocostalis trigger points are found about three inches from the spine and send their pain both upward and downward and a little more to the side (figure 8.5). Trigger points in the region of the lowest ribs send pain down to the buttocks, no matter which muscle they're in. A trigger point in the longissimus right on the lowest rib is a frequent cause of deep pain along the top of the *iliac crest* (hip bone). This is experienced as low back pain and is one of its major causes. This trigger point can occur on either side but is shown low on the left in figure 8.4 (Travell and Simons 1992).

Pain from iliocostalis muscles may also be projected to the front of the body or to the internal organs, and can be mistaken for the pain of angina, pleurisy, appendicitis, or other visceral disease. Pain from trigger points in any of the superficial spinal muscles can be misinterpreted as a symptom of kidney stones, tumors, rib inflammations, ligament tears, or disk problems. When you do have one of these more serious conditions, trigger point therapy will offer only temporary relief (Travell and Simons 1992).

Muscle tension in the superficial spinal muscles can originate in the abdominal muscles. The back-breaking pain that comes from a long, stressful day can be from tight abdominal muscles pulling you down and forward, stretching out the back muscles. Trigger points in the rectus abdominis can also refer to the mid- and low back, causing fatigue and pain across the back (figure 7.23). Relief can be found by massaging both the back and the abdomen. See chapter 7 for more information on abdominal muscles.

Part of your low back pain can even be coming from trigger points in the soleus muscles in your calves. The soleus muscles actually can maintain a hard, spasm-like contraction in the low back muscles. You may also know that trouble with your feet can make your back hurt (Travell and Simons 1992). See chapter 10 for a discussion of the soleus muscle and Morton's foot.

The back-breaking pain that comes from a long, stressful day can be from tight abdominal muscles pulling you down and forward, stretching out the back muscles.

Stiffness or tightness in the back is a sign of latent trigger points in the back muscles, even when you're not presently having pain. Latent trigger points should be taken seriously because they're an indication that you're verging on trouble. Any little additional stress can quickly turn a latent trigger point into an active one. Trigger points that keep the muscles on one side of the back contracted can cause scoliosis curves. Muscle tension maintained by trigger points can also pull the sacroiliac joint out of place, keeping the pelvis twisted or cocked.

When tight superficial spinal muscles squeeze the sensory nerves, the skin on your back may be hypersensitive or have patches of numbness (Travell and Simons 1992).

Causes

Picking up something that is too heavy for you is a major cause of trigger points in your superficial spinal muscles, especially if you lift suddenly or when your body is not straight and centered. The superficial spinal muscles are particularly vulnerable when you do anything strenuous while bending to one side. Lifting something this way puts the full load on just one half of the back, in effect doubling the strain. In all aspects of your work and play, think in terms of distributing the load evenly and you won't go wrong.

Whiplash is another common cause of strain to the superficial spinal muscles. Prolonged immobility or staying in a strained position too long can also create trigger points in these muscles. Repetitive motion on the job is sure to make trouble. Repetitive tasks never give your muscles a chance to rest and catch up.

Treatment

The best approach to massaging the superficial spinal muscles is simply to back up to a wall with a tennis ball. Use a lacrosse ball or 60 mm hard rubber high bounce ball if you need to penetrate deeper. They also grip the wall nicely (unlike the tennis ball, which is slippery). You can put the ball in a long sock

so you'll have a handle for better control of positioning

(figure 8.6). Several other back muscles can be worked on at the same time this way, including the lower trapezius muscles, latissimus dorsi, levator scapulae, rhomboids, and serratus posterior superior.

Massaging your back with a ball on the floor or on your bed makes good use of the weight of your body. The disadvantage is the loss of some measure of maneuverability. The Thera Cane is a good tool for the back; many people prefer it for the convenience. The Backnobber may be even more convenient, because it can be taken apart and packed in a carry-on suitcase.

If massage of a particular spot seems especially painful, remind yourself that it hurts less when you consciously relax the muscles while you work on them. And don't forget to breathe. When you hold your breath, you also tend to hold muscles tight.

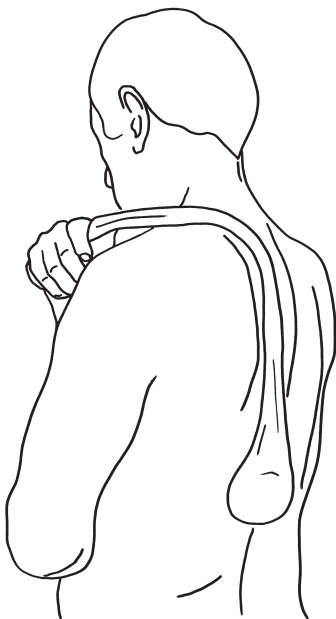


Figure 8.6 Massaging superficial spinal muscles with ball in sock against a wall

How to Use a Ball against a Wall

To use a ball against a wall, start by placing the ball over your shoulder in the upper back. Leaving your back leaning into the ball against the wall, step your feet out away from the wall and roll the ball up and down. It doesn't feel good to go back and forth across the spine, but it feels great to massage right beside the spine. If it feels okay to your low back, bring your pelvis forward toward the room and back toward the wall to roll the ball a couple of inches, rather than bending your knees to do it. To move the ball down to a new spot, put your rear end against the wall and slightly lean forward, allowing gravity to move the ball an inch or two down your back. Start the ball high in your back and work your way down.

To access the lower trigger points, start the ball just below the lowest ribs. After placing the ball, bend your knees to roll the ball up against the lowest ribs. There are four trigger points possible on each side of the spine. The iliocostalis trigger points are approximately three to four inches from the spine.

Don't let the idea that you "should" do this therapy three, four, or even six times a day discourage you. If you get it done once a day, that's great! Pat yourself on the back. You will make progress.

Serratus Posterior Inferior

The *serratus* (seh-RAY-tus) *posterior inferior* muscles attach to four vertebrae in the low back and to the four lowest ribs. This gives them the ability to help support the weight of the body during movement and to assist forced exhalation (Travell and Simons 1992). Pain from trigger points in the serratus posterior inferior usually has the character of a localized ache, which can be mistaken for a sign of kidney distress (figure 8.7). Trigger points can cause tightness in the muscle that will tend to restrict movement, especially bending or twisting (Travell and Simons 1992).

In caring for all your serratus posterior inferior muscles, overreaching yourself is bad, both literally and figuratively. Stretching to reach overhead can strain the serratus posterior inferior muscles, particularly if they're cold or are harboring latent trigger points. Too much twisting of the body or bending to the side is also not good for them. Arrange your work so that you don't have to make strained movements, especially in a repetitive manner.

Give some attention to your bed. A mattress should give a little in the right places to accommodate the curves of the body, but a sagging mattress is bad for the serratus posterior inferior muscles as well as for the other muscles of the back.

The Thera Cane, Backnobber, or a ball against a wall all work well for massage of the serratus posterior inferior muscles. Be aware that in the area around the lower ribs, there may be trigger points in several different muscles. Don't be misled by an especially hot one, believing you've found them all: there may be others close by in any direction. It's difficult to differentiate the muscles in the lower back. Just be meticulous in your search for spots of exquisite tenderness. Troubleshooting for trigger points is a matter of simply getting in the ballpark, then checking the area, inch by inch.

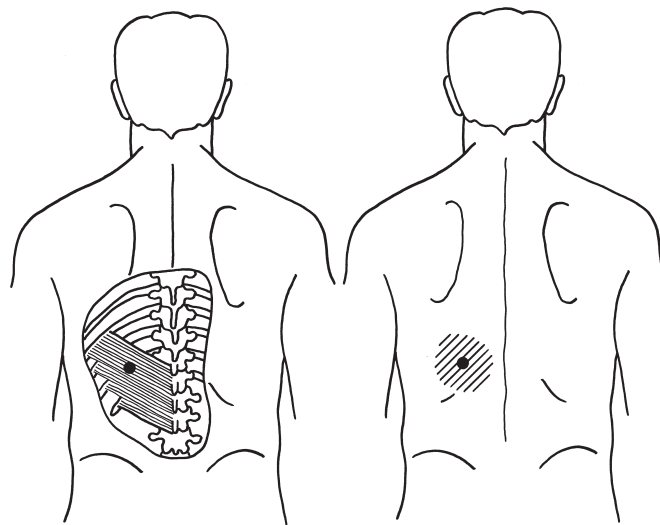


Figure 8.7 Serratus posterior inferior trigger point and referred pain pattern

Quadratus Lumborum

The *quadratus lumborum* (kwa-DRAY-tus lum-BOR-um) is a four-sided muscle that connects to the bottom rib and the top of the pelvis on each side. The top rim of the pelvis, which you recognize as your hip bone, is called the *iliac crest*. The iliac crest is an important bony landmark for guiding you to several important muscles. Try tracing it with your thumb from the front of your hip all the way around to the base of your spine. You may enjoy saying “quadratus lumborum”; if not, just call it the “QL.”

The quadratus lumborum muscles attach to the sides of the lumbar vertebrae, connecting them to the pelvis and ribs. All these attachments, right where you do so much bending, give the quadratus the leverage to support the entire upper body. Without them, you'd sway around like a flower on a slender stem. The QL raises the pelvis on the same side when lifting the foot off of the ground when walking. Besides controlling movement at the waist, both sides of the quadratus lumborum participate together in forced exhalation, such as in coughing or sneezing.

Symptoms

Eileen, age forty-seven, suffered spells of excruciating low back pain ever since being hit by a car twenty years earlier. The pain extended downward into her left buttock and hip. Her problem was made worse by her job, which entailed standing most of the day on a concrete loading dock. Only an hour of standing made her back hurt so bad she could hardly keep her mind on her work. Sometimes she couldn't walk, stand, or even sit upright. Her only relief came from lying down.

"I've had lots of chiropractic and physical therapy, but nothing solves the problem. I take all kinds of pills just to keep going. How else am I going to be able to work?"

Trigger points were found in Eileen's *longissimus* and *quadratus lumborum* muscles on her left side, where she felt most of the pain. Three sessions of massage cut her pain by 75 percent. She subdued the rest of the pain herself with a tennis ball and a Thera Cane.

Pain from trigger points in the quadratus lumborum muscle can occur in the hips, buttocks, or around the sacroiliac joint at the base of the spine (figures 8.8 and 8.9). Deep, aching pain may be present at rest and worsening pain, when sitting or standing. Side bending, twisting, and leaning forward can be painful as well as walking up stairs. Rolling over in bed can be difficult and extremely painful. Coughing or sneezing is likely to bring sharp agonizing stabs of pain. The pain is psychologically paralyzing, making you reluctant to move. You may not be able to turn over in bed or to lie on the afflicted side. Sometimes pain is felt in the groin, testes, scrotum, and down the front of the thigh, or locally in the muscle (not shown). Intense tenderness over the *greater trochanter* (tro-CAN-ter), which is the knob at the top of the thigh bone, can be caused by QL trigger points. A tight quadratus lumborum muscle restricts pelvic movement, causing trigger points to arise in the gluteus minimus muscle, which in turn can cause symptoms of sciatica. The tension in one quadratus muscle can pull a lumbar vertebra or the sacroiliac joint out of place. It can pull your rib cage down and put an abnormal curve in your back, making you appear to have scoliosis or a short leg (Travell and Simons 1992).

The pain from quadratus lumborum trigger points is commonly mistaken for arthritis of the spine, disk problems, sciatica, or bursitis in the hip. A physician confronted with these symptoms may feel justified in examining you for kidney stones, urinary tract trouble, and other internal or systemic problems (Travell and Simons 1992).

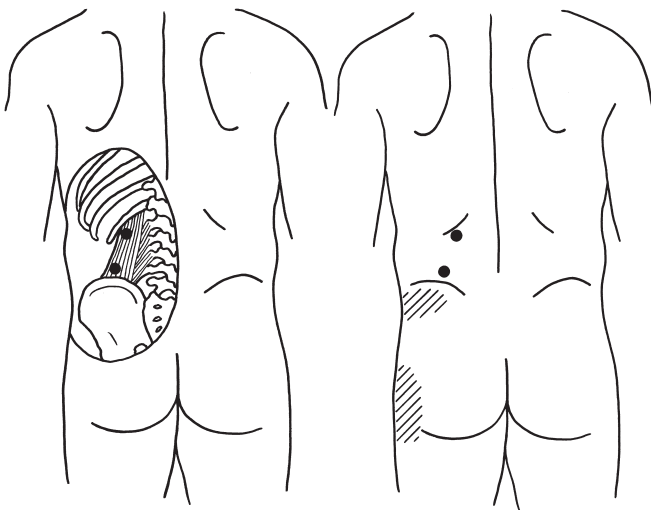


Figure 8.8 Quadratus lumborum lateral trigger points and referred pain pattern

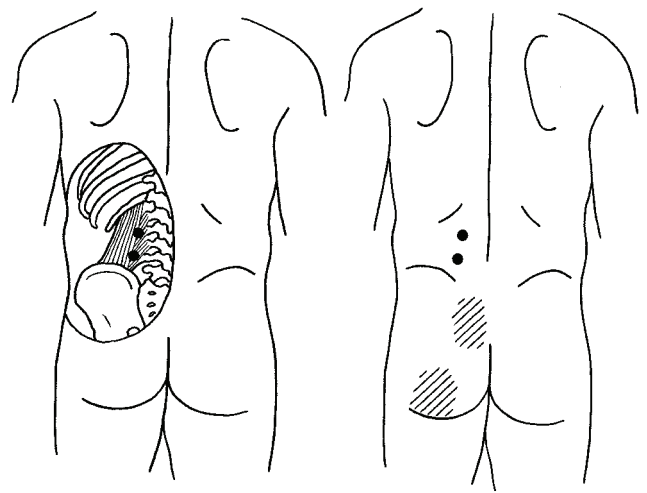


Figure 8.9 Quadratus lumborum medial trigger points and referred pain pattern. These points are hidden underneath the superficial spinal muscles.

Causes

A short leg, short upper arms, or one side of the pelvis being smaller than the other can set up trigger points in a quadratus lumborum muscle. Sitting leaning to one side so your elbows meet the armrest keep this muscle in trouble on both sides. This muscle is often traumatized in falls and in auto accidents, and by heavy lifting while twisted at the torso. It can also be strained if you twist to pick something up from the floor or when getting up from a low chair, car seat, or bed. Wearing a walking cast can create a leg-length inequality that can cause back and hip pain in one or both sides of the body (wearing a thick-soled shoe on the uninjured foot will help). Tension from common emotional stress often finds a home in this muscle (Travell and Simons 1992). See chapter 12 for help with habitual muscle tension.

Interestingly, the QL is left vulnerable to stress and overuse when the gluteal muscles are stiff and weakened by trigger points. When the gluteals aren't doing their job, the quadratus lumborum must take up the slack. Then it tires out, freezes up, and leaves you with twice the trouble you had to begin with. Since the gluteal and quadratus lumborum muscles work together, they are usually afflicted with trigger points at the same time.

Treatment

Confirm the location of the quadratus lumborum by feeling it contract when you hike your hip up toward the ribs. The muscle is easier to isolate when you're lying down (figure 8.10). If you push your finger or thumb into the side of your back between your hip bone and lowest ribs, you will encounter a solid wall of muscle. This is the edge of both the quadratus lumborum and the superficial spinal muscles. The quadratus lumborum is on the front side of this short column of hard muscle. The longissimus and iliocostalis are on the back of it.

If the quadratus lumborum is causing pain, there are likely to be trigger points in several places. An efficient way to massage this muscle is with a tennis, 60 mm high bounce, or lacrosse ball against a wall (figure 8.11). Stand upright with your side at a 90-degree angle to the wall; position your arm forward of your body and out of the way. Place the ball just below the ribs and slowly turn the front of your body away from the wall. When your body is positioned at about a 45-degree angle to the wall, you will find the lateral trigger points (figure 8.8). To press the upper lateral trigger point against the ribs, bend the knees slightly to roll the ball upward. The lower lateral trigger point can be pressed against the hip bone when you straighten the legs and roll the ball downward. These outer trigger points feel like bruises.

To find the deeper, more problematic medial trigger points (figure 8.9), it is critical to sneak in sideways underneath the vertical superficial spinal muscles. After doing the technique as described in the paragraph above, search for the medial trigger points. Let your tummy muscles relax, put your body weight on the outside leg (let the leg of the treatment side just carry its own weight), and turn the front of your body away from the wall to about a 25-degree angle. Press the ball slowly in toward the spine and upward toward the opposite shoulder. You are trying to get the ball in the corner between the ribs and the spine. Keep in mind the ball will be about two to three inches away from the bony spinous processes of the vertebrae. Don't flatten your back against the wall; maintain the 25-degree angle to the wall.

It is difficult to appreciate from this two-dimensional drawing (figure 8.9) that the two trigger points closest to the spine are under—or “deep to”—the superficial spinal muscles. Follow the directions closely to access these important and often missed points.

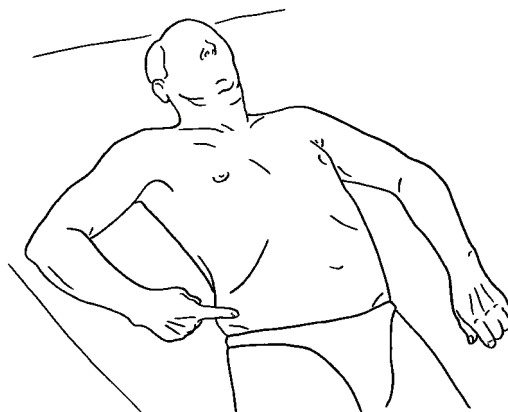


Figure 8.10 Feel quadratus lumborum contract between the abdominal obliques (see finger) and the superficial spinal muscles

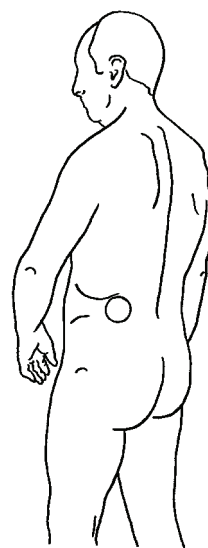


Figure 8.11 Quadratus lumborum massage with ball against a wall

Massage in whatever direction feels the most effective with the least amount of effort. Once you have massaged this upper medial trigger point with ten to twelve strokes, move the ball down the spine by bending the knees and then repositioning the ball an inch or two downward. As you slowly straighten your legs, the ball will roll downward as you explore the whole lumbar area. At the bottom of the spine, you will find the lower medial trigger point in the corner between the hip bone and the spine. Angle the ball toward the opposite buttock. Again, you will be sneaking in sideways in front of the spinal muscles. If your back is flat against the wall, you will find trigger points in only the spinal muscles but not in the quadratus lumborum. The spinal muscles and fascia are too thick to penetrate here. You have to go around and in front of them to treat the quadratus lumborum.

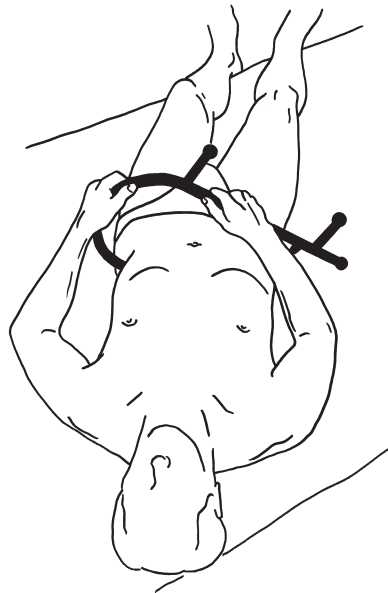


Figure 8.12 Quadratus lumborum lateral trigger points massage with Thera Cane

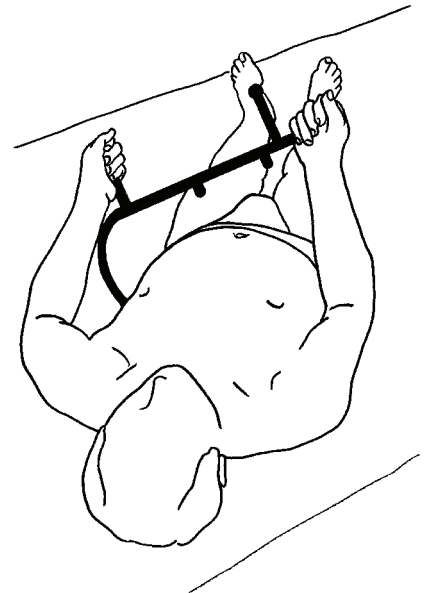


Figure 8.13 Quadratus lumborum medial trigger points massage with Thera Cane

If the space between your lowest ribs and pelvis is less than the width of two fingers you will find lying flat on your back in bed with the Thera Cane a much better way to massage the quadratus lumborum. If you have a more generously proportioned torso, a Big Bend Backnobber may be the tool for you. To massage the lateral pair of trigger points as shown in figure 8.8, place the end of the Thera Cane against the front of the muscle, with the cane across your body and the opposite end touching the bed (figure 8.12). Pull down with both hands, pressing the muscle down toward the bed. Execute the stroke downward and toward the outside of the body.

For the medial pair of trigger points (figure 8.9), position the knob of the Thera Cane under your back, about halfway across, as shown in figure 8.13. In the drawing, the left hand stays perfectly still, like a fulcrum or pivot. The right hand executes a rowing motion, pressing toward the ceiling and then stroking toward the face. To massage the quadratus on the right side, simply reverse the tool and the hands. Be aware that the kidneys are vulnerable below the lowest rib where they are protected only by muscle. Pressing the quadratus lumborum against the nearby bones effectively treats the muscle while avoiding the kidneys.

If you have pain from quadratus lumborum trigger points, but you're in a situation where you can't stop and work on them, just pinch the skin over the quadratus lumborum hard enough to hurt a little. This distracts the nervous system and quiets the pain signals long enough to get you where you're going. It will at least enable you to walk and get out of the middle of the street.

Gluteus Maximus

People tend to think of their *gluteus* (GLU-tee-us) *maximus* as simply something to sit on. The truth is that without your gluteal muscles you'd literally fall on your face. You wouldn't be able to walk, run, jump, or even stand up. Of the nine buttock muscles, the gluteus maximus is the largest. Trigger points in the gluteus maximus cause pain in the low back, tailbone, sacral iliac joint, and the buttocks themselves.

The function of the gluteus maximus is hip extension, which is the action employed in straightening the leg when climbing stairs. Jumping, running, and fast walking require the power of these muscles; they're only mini-

mally active during easy walking. The gluteus maximus muscles contract strongly when you lean over with your knees bent or when you squat or do a deep-knee bend. They also help you get up from a sitting position.

Symptoms

Gluteus maximus trigger points don't send their pain very far. Depending on the trigger point's location, pain is felt in the low back, outer hip, tailbone, gluteal fold, or in the sacroiliac joint at the base of the spine (figures 8.14, 8.15, and 8.16). You may find yourself constantly changing position while sitting due to a general aching and burning in the buttocks. Your hips may feel stiff, you may have difficulty getting up out of a chair, and you may limp. Pain can come while rising from a low sitting position such as on the toilet or low car seat. If you can no longer bend over and touch your toes, part of the problem may be a shortening of gluteus maximus muscles. Pain in the coccyx, or tailbone, while sitting can really be referred pain from trigger point number 3 (Travell and Simons 1992).

Pain caused by gluteus maximus trigger points is often blamed on bursitis of the hip (trochanteric bursitis), a compressed disk, arthritis, coccygodynia, sciatica, or a sprung sacroiliac joint. Pain in the tailbone can be mistaken for damage or disease when it's only referred pain from a nearby trigger point (Travell and Simons 1992). Trigger points in your gluteus maximus can disrupt the comfortable patterns of everyday life, if not make that life completely miserable. A vivid example of this was Kenny.

Kenny, age forty-two, was a long-haul truck driver. Kenny wasn't bothered as much by his chronic low back pain as he was by the constant aching and burning in his hips and gluteal area. It was impossible to find a comfortable sitting position. The long hours on the road had become intolerable. "I feel like I ought to look for another line of work. The trouble is I'd like the job I've got just fine if it just wasn't for this problem."

Kenny's problem gluteus maximus muscles were adversely affected by sitting day in and day out behind the wheel of his truck. Practical treatment for a traveling

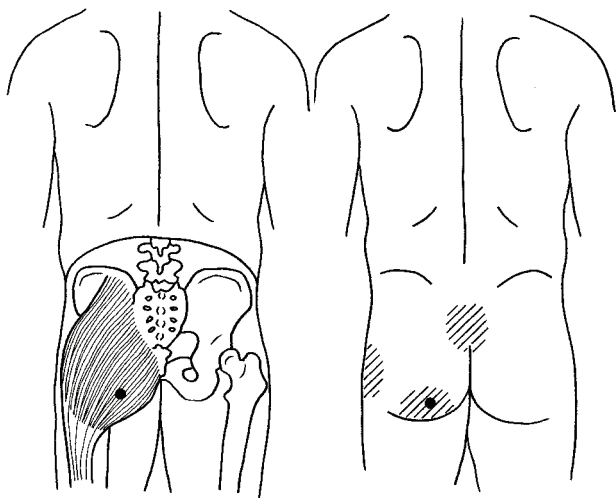


Figure 8.14 Gluteus maximus number 1 trigger point and referred pain pattern

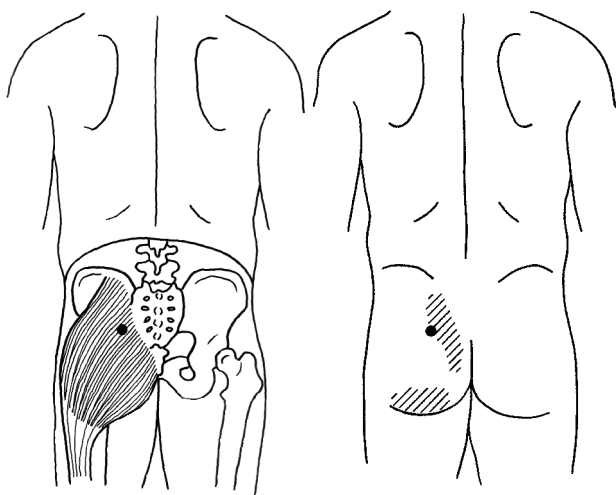


Figure 8.15 Gluteus maximus number 2 trigger point and referred pain pattern

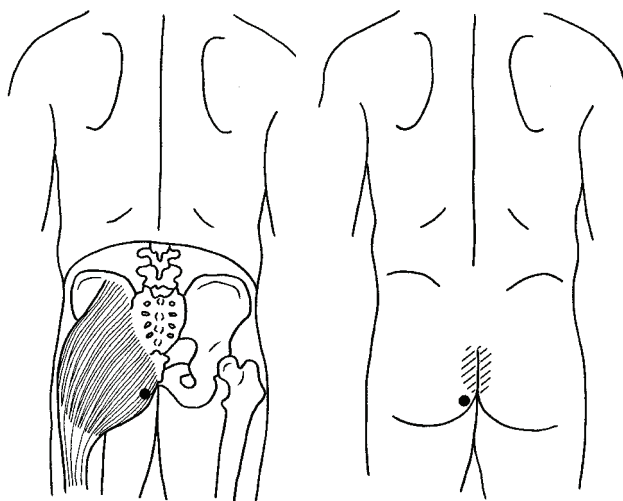


Figure 8.16 Gluteus maximus number 3 trigger point and referred pain pattern

man included working on his trigger points with a tennis ball in the sleeper bed in the back of the truck's cab. He also found it helpful to stop more often to get out and walk around.

Causes

Climbing or unaccustomed gym exercise can set up trigger points in gluteus maximus muscles when you're out of shape. Trigger points can also come from soft tissue trauma experienced in a fall, or even the sudden hard contraction of muscle when you catch yourself to keep from falling. Swimmers who use the flutter kick often overtax these muscles (Travell and Simons 1992).

Sitting on hard surfaces or just sitting too much activates trigger points in gluteus maximus muscles. Office chairs are particularly bad for them, often having only a layer of highly compressible foam rubber over a rock-hard plywood or molded-plastic seat. Office workers who must sit all day are prone to chronic backache emanating from gluteal trigger points (Travell and Simons 1992).

Other hidden factors make trouble. Trigger points can cause enough tension in the gluteus maximus muscles to disturb the sacroiliac joint and add to your low back pain. Stiffness in trigger point-afflicted spinal, abdominal, or thigh muscles can put an extra strain on gluteal muscles (Travell and Simons 1992).

To prevent trouble with gluteus maximus muscles, examine your lifestyle. Look for opportunities to be on your feet and active at something. The lack of exercise that comes from too much sitting encourages the development of latent trigger points that make the muscle shorten and stiffen up. Sitting also restricts circulation in the gluteus maximus. Place a timer set for every fifteen to twenty minutes across the room from your chair. Simply rising and crossing the room to turn it off may be enough to keep trigger points away. Check for latent trigger points before beginning a regime of exercise involving the gluteus maximus, such as stair climbing, squats, gym workouts, or running. If you know you've had trouble with this muscle in the past, take the time to massage it before and after activities that stress it.

Treatment

There's no mystery about the location of your gluteus maximus. It covers all the other buttocks muscles, except portions of the gluteus medius and minimus near the hip. A tennis, 60 mm high bounce, or lacrosse ball against a wall gives the best maneuverability for gluteus maximus massage (figure 8.17). The lower two trigger points are on either side of the sit bone. To massage them you will need to lean forward and place your hands on your knees for support. Feeling silly yet? Good, you are likely getting the right spot. Trigger point number 3 is between the tailbone and the sit bone (ischial tuberosity). You should feel like you are laying an egg when massaging this spot. Try sitting on the ball, too. For maximum pressure, you may want to lie on the ball in bed or sit on it on the floor. When lying on the ball, pull your knee up to facilitate freer movement. The Thera Cane is also good for some quick work, although it can be hard to get enough pressure to go deep (figure 8.18). A couple of minutes of massage several times a day gets rid of gluteus maximus trigger points within a few days, and improvement usually begins immediately.

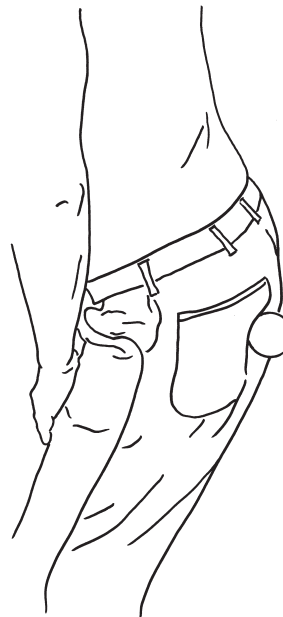


Figure 8.17 Massage of gluteal muscles with ball against a wall

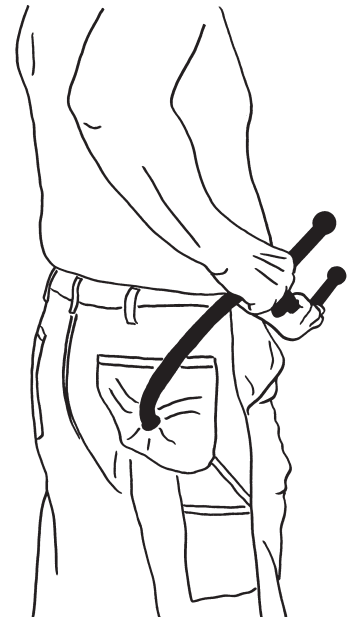


Figure 8.18 Massage of gluteal muscles with Thera Cane

Gluteus Medius

The *gluteus medius* is at the top of the list of the many muscles that cause low back pain. A great deal of low back pain could be ended quickly with proper attention to gluteus medius muscles (Travell and Simons 1992). The following case history shows how easily back pain can be treated, once you have the appropriate information.

Duane, age thirty-nine, was totally incapacitated with intense low back pain after moving a heavy couch by himself. "It was on the curb. I was afraid somebody else would get it if I took time to go find help." Now he couldn't sleep because of the pain and he hadn't smiled in two days. The curve was gone from his lower back, his pelvis was locked in a posterior tail tuck, and he could hardly walk. He was sure that he'd done horrible damage to his spine. He'd been to the emergency room where he'd been given muscle relaxants and a painkiller; he'd been to the chiropractor twice. Nothing helped.

Three days after deep massage to his buttocks and low back muscles, Duane was walking erect with very little pain. His hips were free and the curve had returned to his back. He was sleeping, too. "If my back starts hurting in the night, I just reach for the tennis ball and work on it right there under the covers," he said. "Why didn't the doctor tell me about that?"

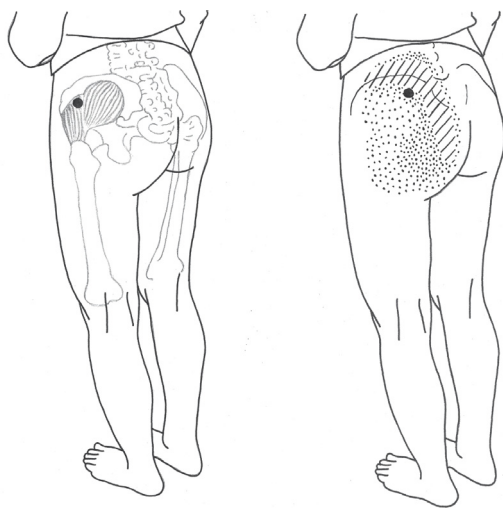


Figure 8.19 Gluteus medius number 1 trigger point and referred pain pattern

Symptoms

Pain from trigger points in gluteus medius muscles is felt in the low back just above and below the belt line and often extends into the buttocks and hips (figures 8.19, 8.20, and 8.21). Back pain from this source can be excruciating and disabling, seriously undermining endurance. Pain in the hips can make it hard to find a comfortable sleeping position. Gluteus medius trigger points are a frequent cause of hip and low back pain in the later months of pregnancy. Pain in both the hips and low back can make walking almost impossible (Travell and Simons 1992; Sola 1985).

Afflicted gluteus medius muscles can pull the rim of your pelvis down in back, stiffening and flattening your lower back and adding to your disability. Chronic shortening of gluteus

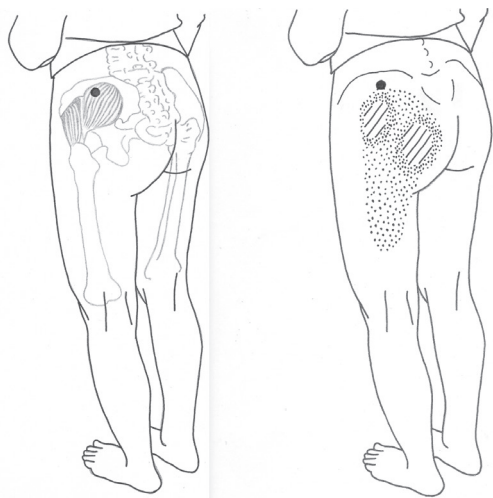


Figure 8.20 Gluteus medius number 2 trigger point and referred pain pattern

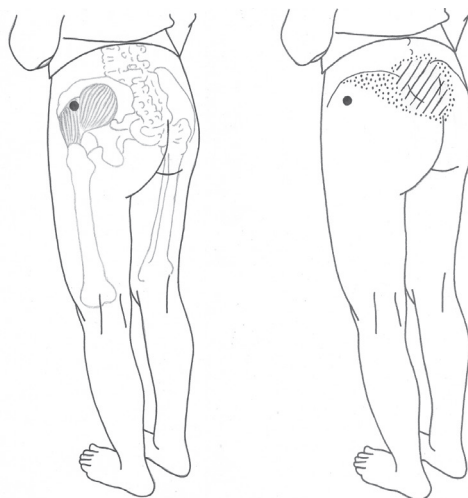


Figure 8.21 Gluteus medius number 3 trigger point and referred pain pattern

medius muscles caused by latent trigger points can make you stand and walk with your tail tucked under (Travell and Simons 1992).

The common assumption is that pain in the low back is caused by some problem in the lumbar spine, such as arthritis, a herniated disk, disarticulated vertebrae, a compressed nerve, or a sacroiliac joint dysfunction. X-ray and MRI evidence of these spinal abnormalities is often used to justify surgery for low back pain, although such abnormalities are often found in people who never suffer low back pain. Pain from myofascial trigger points that remains after surgery can be greatly mystifying and frustrating to both doctor and patient. It's disturbing to think that trigger points may have been the only thing needing correction in the first place (Travell and Simons 1992). Of course, there are times when surgery is necessary. However, try less invasive treatments, such as trigger point massage, first before resorting to surgery.

Causes

Although the gluteus medius is no more than half the size of the gluteus maximus, it's still a very thick, strong muscle whose primary function is allowing you to walk upright. Each time you take a step, the gluteus medius muscle of the opposite hip contracts to keep the pelvis from tilting when you lift your foot. As you walk along, the gluteus medius muscles take turns supporting the entire weight of the upper body. Because of the leverage at the hip, gluteus medius muscles have to alternately generate a force equal to more than twice the body weight.

Any additional demand or imbalance is compounded in this same way. For instance, consider that each pound of excess body weight adds two pounds to the workload of the gluteus medius muscles. You may have observed that heavy people often lumber or waddle, throwing their weight from side to side as they walk. This is the body's natural effort to protect itself by moving the weight fully over the leg with each step instead of requiring the gluteus medius muscles to lever it. Waddling may not look great, but don't knock it: it's pretty good body mechanics under the circumstances. Low back pain in pregnancy can be traced to trigger points in gluteal muscles caused by the stress of being temporarily "overweight."

Gluteus medius muscles can be overworked when you carry heavy weight while walking. Lifting while standing in place doesn't overtax the gluteus medius muscles, as long as the weight is distributed evenly between both feet.

Trigger points in the quadratus lumborum can sponsor trigger points in the gluteus medius and vice versa. This is because each of these muscles lies in the referral area for the other. It's wise to search for tender spots in both muscles when you have low back pain. The tensor fasciae latae muscle is another common ally of the gluteus medius in hip pain and dysfunction.

Other potential causes of overload in these muscles are weight lifting, running, falls, aerobic exercise, sitting on a wallet in your back pocket, and habitual weight bearing on one side of the body, such as carrying a child always on the same hip. Standing or sitting still for long periods of time makes the gluteus medius vulnerable by encouraging stiffness. Leg-length inequality can create trigger points in the gluteus medius. A common condition called Morton's foot can cause unstable foot placement, which can bring about trigger points in gluteus medius muscles (Simons, Travell, and Simons 1999). Morton's foot is discussed in detail in chapter 10.

As a safeguard for the gluteus medius muscles, don't stand on one leg to put on your pants. You can easily strain a muscle when you catch a foot in a pants leg and unexpectedly have to catch your balance. Sit down to get both feet through, then stand to finish pulling your pants up. It may seem a little silly at first, but it's a habit that becomes increasingly valuable with the passing years.

You may prefer to take your injections in a hip rather than an arm or shoulder. Just be aware that injections anywhere can set up trigger points and leave you with pain. When this happens, it's good to be able to recognize a myofascial problem and know what to do about it.

Sitting a lot with your legs crossed is bad for these muscles, especially if you always cross the same leg. When you exercise, remember that moderate exercise done frequently is much safer and more efficient for strengthening than infrequent hard-driving sessions.

Treatment

The gluteus medius is under the gluteus maximus, attaching along the rim of the *ilium*, the top of the hip bone or pelvis. The other end attaches to the greater trochanter, the prominent lump at the top of the thighbone. Many muscles attach to the greater trochanter, because of the great leverage it gives for moving the thigh. This bony landmark sticks out on the side of your hip and you can locate it by feel. The relationship between the hip bone and the greater trochanter is shown in figure 8.22. Turn your foot in and out like you are doing “The Twist” to feel the greater trochanter move under your fingertips.

To locate the gluteus medius, shift your weight to one foot while you feel for a contraction just below the top of the hip bone (figure 8.23). The top of your hip bone may be a little higher in back than you may have thought; it can extend an inch or two above your belt line. You can also feel the gluteus medius contract just above the greater trochanter and a little to the rear. It’s not unusual for all the muscles on both of your buttocks to have trigger points at the same time.

Massage the gluteus medius with the same tools used with the maximus, namely the tennis, 60 mm high bounce, or lacrosse ball (figure 8.24). Start by standing up straight with your side against the wall. Find your hip bone that sticks out in front right at the pocket of your pants. This landmark is called the ASIS, or anterior superior iliac spine. Gluteus medius trigger point number 3 is about two inches behind this bony place, or approximately on the side seam of your pants or skirt. Place the ball here and massage side to side or up and down. As you do the massage, bend the knee of the side you are treating and let your body weight rest on your opposite leg.

To find the next trigger point, turn the front of your body away from the wall until your pelvis makes about a 45-degree angle with the wall. This number 2 trigger point is not on the side nor on the back of your body; it is positioned in between, in the curve of the hip. After giving this point a few strokes, move onto trigger point number 1, next to the sacrum. Your body will be slightly turned away from the wall at about a 10-degree angle. If you are flat to the wall, you’ll be on the sacrum. All three of the gluteus medius trigger points are in a line across the top of the buttock.

The Thera Cane and Backnobber are also good tools for massaging the gluteus medius, especially lying down on your side when the muscle can be relaxed. For going really deep into the gluteal muscles, someone else’s elbow is hard to beat. For this procedure, you lie on your side and the person with the elbow sits beside you. If you let a friend or relative work on you, be sure he or she either already understands the concepts outlined in this book or is eager (or at least willing) to learn.

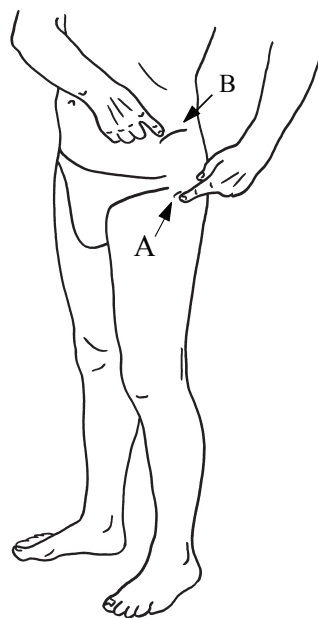


Figure 8.22 Feeling the greater trochanter (A) and the top of the hip bone (B)

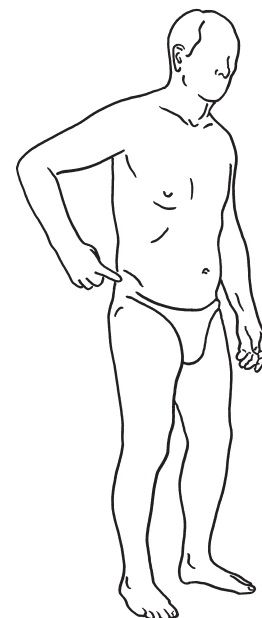


Figure 8.23 Locating gluteus medius by isolated contraction with weight shift to right foot

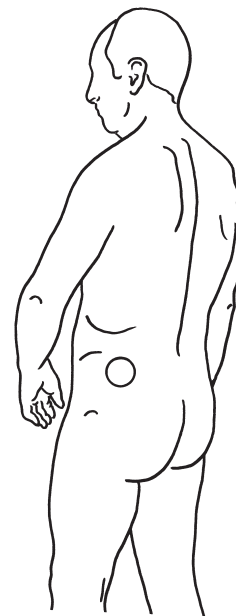


Figure 8.24 Gluteus medius number 2 trigger point massage with ball against a wall

Gluteus Minimus

The *gluteus minimus* muscle attaches to the lower half of the wing of the hip bone or pelvis and to the top of the greater trochanter. It functions just like the gluteus medius in supporting the pelvis during walking, moving the leg out to the side, and turning the leg inward. The gluteus minimus is the smallest of the gluteus muscles, buried under the maximus and medius, which together are six times as large. Considering its size, you might think the minimus would be of little consequence, but it can create great discomfort over a surprisingly widespread area.

Symptoms

Trigger points in the gluteus minimus muscle cause a deep achy pain in the buttock, down the back or the side of the thigh, and into the lower leg as far as the ankle (figures 8.25 and 8.26). Tracking down the problem can be made difficult by pain from associated trigger points in the quadratus lumborum, gluteus medius, piriformis, tensor fasciae latae, vastus lateralis, peroneus longus, and hamstring muscles. Pain from gluteus minimus trigger points can be excruciating and continuous. Numbness can occur anywhere in the referral areas. In addition to leg pain, there is often a diffuse tenderness in the buttocks (Travell and Simons 1992; Zohn 1988).

Walking is painful. Getting up from a chair is painful. You may limp to favor the afflicted side or have difficulty crossing your legs. Rolling over on your “bad side” can awaken you at night (Travell and Simons 1992).

Pain and other symptoms in the buttocks and backs of the legs are collectively called “sciatica,” independent of the cause. Sciatica would be a good description of this pain, but not an accurate diagnosis. Real *sciatica* results from compression of the sciatic nerve or its nerve root at the spine. Gluteus minimus trigger points usually refer a deep achy throbbing pain rather than the sharp electrical jolt created by a pinched or compressed nerve. Sciatic symptoms can also be mistaken for evidence of a ruptured disk, arthritis of the spine, bursitis of the hip, or sacroiliac joint dysfunction. When a clinician or physician fails to explore the gluteus minimus as a possibility for the source of the pain, treatment failure is likely (Travell and Simons 1992).

Causes

Sitting on a fat wallet is a well-known cause of trigger points in the gluteus minimus, resulting in “back-pocket sciatica.” Pressure from the wallet inhibits blood flow. Trigger points predictably arise in muscles where circulation is restricted (Travell and Simons 1992).

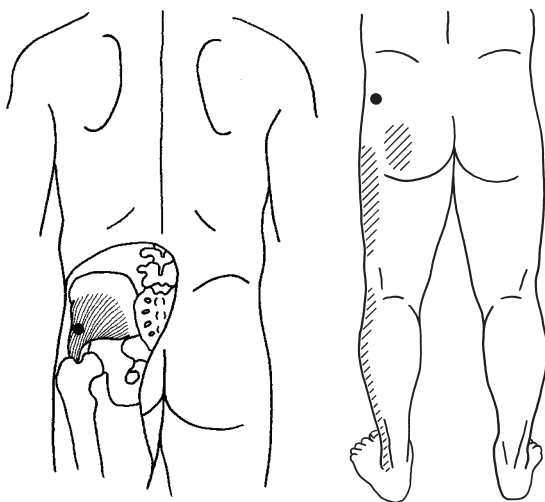


Figure 8.25 Gluteus minimus number 1 trigger point and referred pain pattern

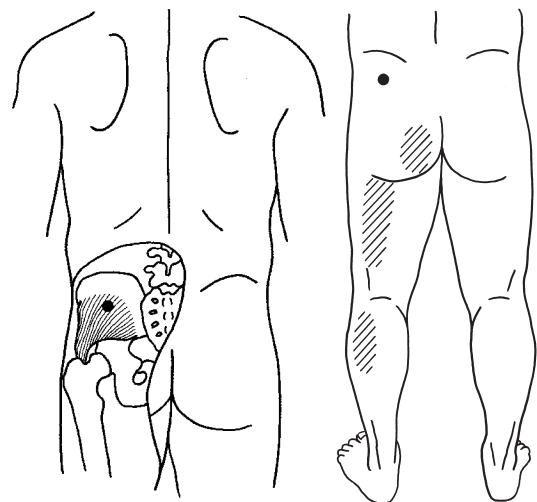


Figure 8.26 Gluteus minimus number 2 trigger point and referred pain pattern

Falls, sports activities, prolonged sitting, prolonged standing, and running or walking too much are examples of things that can foster trigger points in gluteus minimus muscles. Suddenly overcontracting the muscle, a fall that causes trauma to the soft tissue, chronic overload from being overweight or carrying heavy objects, and injections can all cause trigger points in this muscle. Compression of a nerve at the spine will also create satellite trigger points that cannot be resolved until after the nerve impingement is completely treated. Pain from nerve impingement tends to be more severe and have a nervy sensation, a sudden shooting pain like you stuck your leg in a light socket. Trigger point pain is more often deep and achy. Limping to favor a bad knee or sore foot places undue stress on this muscle. Carrying your weight on one leg, such as when using crutches, makes the gluteus minimus on that side work double time (Travell and Simons 1992).

Chronic sacroiliac joint displacement can be due to trouble in the gluteus minimus, superficial spinal, quadratus lumborum, gluteus medius, gluteus maximus, piriformis, and thigh adductor muscles (Travell and Simons 1992).

In an acute pain crisis, the most important thing to do is to calm down and relax. Emotional tension makes muscle tension which makes more pain. Remind yourself: this is only temporary.

Treatment

Shift your weight from side to side to feel the gluteus minimus contract just above and a little behind the greater trochanter (figure 8.27). You will feel the greater trochanter rotate under your fingers on the side of your hip when you turn your foot in and out as if dancing “The Twist.” Use a tennis, 60 mm high bounce, or lacrosse ball against a wall for massage of the gluteus minimus (figure 8.28). Start by standing with your side against the wall. Place the ball just above the greater trochanter on your side. Search for tender trigger points by rolling the ball from side to side or up and down. Let your body weight rest on the outside leg, allowing the knee of the side you are treating to bend slightly. This allows the muscle to relax so you can get in a little deeper. Now roll the ball around the backside of your hip and onto the buttock. Search here, and then explore the whole area by moving the

ball upward in one-inch increments with your hand or by bending your knees. Remember to massage the side of the hip an inch or so higher than where you began at the greater trochanter. The gluteus minimus is deep to the gluteus medius, which completely covers it, and just above the piriformis, which makes an almost horizontal band just behind the greater trochanter. Lie down on your side to use a Thera Cane or Backnobber on these muscles. Some people also use the ball lying on the floor or bed. This technique gives excellent pressure, sometimes too much, but it can be difficult to maneuver the ball around.

Satellite trigger points can develop in the gluteus medius, quadratus lumborum, piriformis, tensor fascia latae, vastus lateralis, hamstrings, and peroneus longus. If you want to take better care of your gluteus minimus, be careful about overdoing any activity that involves vigorously shifting your weight from side to side or bearing your weight primarily on one side. Even jogging and walking can be bad for the gluteus medius and minimus if trigger points are handicapping them.

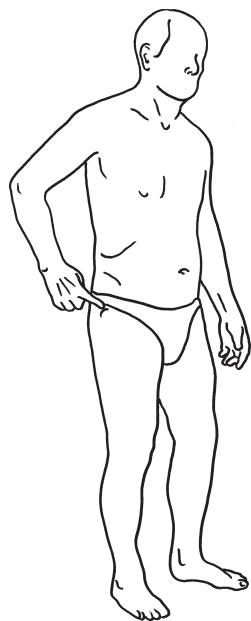


Figure 8.27 Locating gluteus minimus by isolated contraction with weight shift to right foot

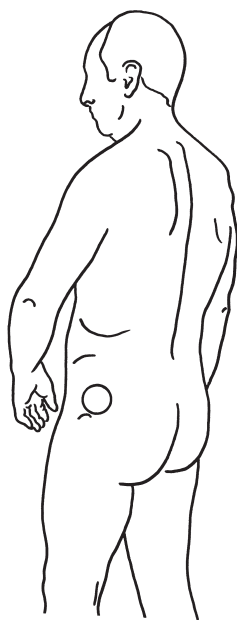


Figure 8.28 Gluteus minimus number 1 trigger point massage with ball against a wall

Piriformis

The *piriformis* (peer-uh-FOR-miss) is the largest of six short hip rotator muscles that are located between the sacrum and the greater trochanter in the middle of the buttocks. The piriformis muscle attaches just inside the rim of the sacrum and then travels across to attach to the top of the greater trochanter. With the leverage gained by these attachments, the piriformis is able to strongly rotate the leg outward. When the leg is stationary, the piriformis turns the body in the opposite direction as when swinging a golf club. Overdoing either of these rotary movements tends to set up trigger points in the piriformis muscle. The piriformis muscle can cause an incredible amount of misery, as much from nerve and blood vessel entrapment as from the referral of myofascial pain. When the piriformis is to blame for your trouble, you're lucky if you ever find out, as shown by Steve's story.

Steve, age forty-five, a traveling salesman for a drug company, had suffered for years from a deep ache in his right hip. His discomfort rarely rose to the level of outright pain, but it was unrelenting and oppressive. Sometimes he also had pain, numbness, and tingling in his foot and the back of his leg. "It's pretty obvious it comes from being in the car so much, but I've got to drive to make a living. I like to play handball, which you'd think would help loosen it up, but it actually makes it worse. I've been to physical therapy and do a lot of stretches, but it never gets much better."

Trigger points in Steve's right piriformis muscle were found to be causing his hip pain. An unexpected overload of the muscle during a quick turn while playing handball probably started the problem. Sitting behind the wheel of the car for hours actually wasn't the source of the trouble, but the inactivity did encourage the muscle to stiffen. Self-applied massage to his piriformis muscle stopped the aching in Steve's hip and the occasional pains in his leg. He took steps to keep the muscle flexible by moving his leg into alternate positions while driving. He's also trying to become more aware of body mechanics in his handball games.

Symptoms

Pain and other symptoms in the buttocks are likely to be composite effects from more than one muscle. Nevertheless, in most instances, you can expect the piriformis to be involved. Piriformis muscles make a great deal of trouble, especially for women. For some reason, problems caused by trigger points in piriformis muscles are six times as prevalent in women as in men. Luckily, once you grasp the cause and effect of myofascial pain, these problems aren't difficult to cope with (Travell and Simons 1992; Pace and Nagle 1976).

Referred pain from the piriformis is felt in the sacrum (the base of the spine), the buttocks, and the hip (figures 8.29 and 8.30). Either trigger point may refer to the entire buttocks area. Occasionally, pain spreads to the upper

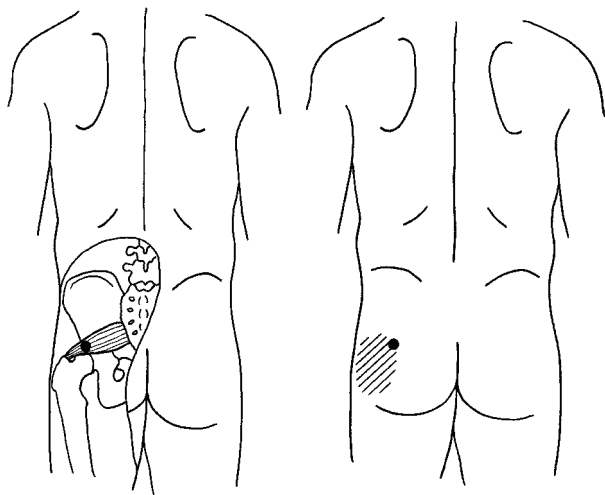


Figure 8.29 Piriformis number 1 trigger point and referred pain pattern

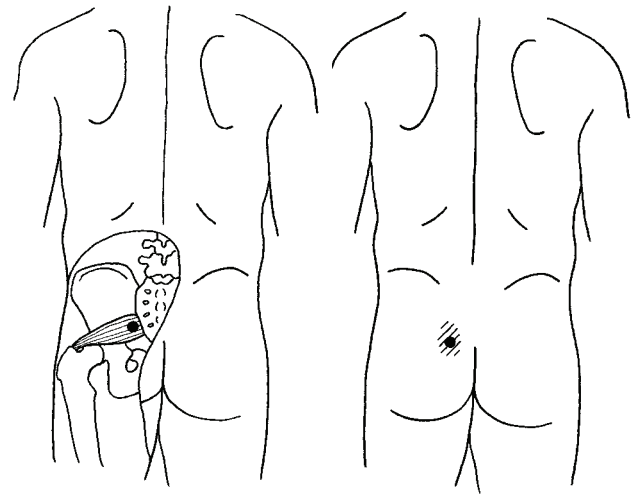


Figure 8.30 Piriformis number 2 trigger point and referred pain pattern

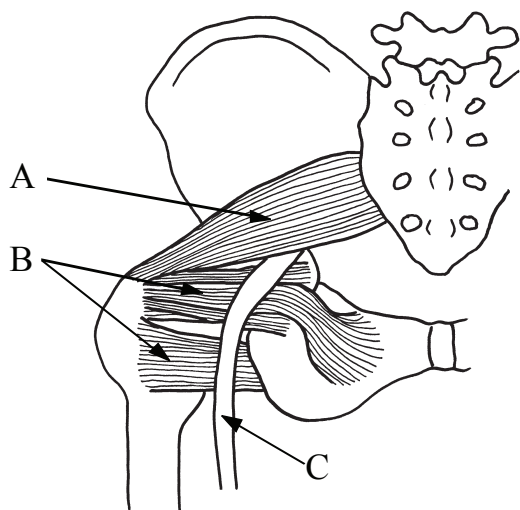


Figure 8.31 (A) piriformis, (B) the other short hip rotators, (C) the sciatic nerve (posterior view)

hamstrings (not shown). Trigger points occurring in the other short hip rotator muscles, located just below the piriformis (figure 8.31), are believed to have similar referral patterns (Travell and Simons 1992; Retzlaff et al. 1974).

Tension in the piriformis can put a twist in the sacroiliac joint, adding to your pain. The resulting tilted sacrum can make you appear to have a short leg. Shortening of the piriformis sponsored by trigger points makes it difficult to cross your legs or rotate your leg inward. Spreading your legs may also be extremely painful. You may limp because of the pain. When trigger points are bad enough, you may not be able to walk. You will be unable to find a comfortable sitting position; you'll tend to squirm and shift around constantly. Sitting aggravates afflicted piriformis muscles. Lying down brings little relief (Travell and Simons 1992).

A shortened piriformis muscle also swells, growing in diameter and causing compression of the sciatic nerve, which results in an entirely separate set of symptoms. Pain from sciatic nerve compression is harsher than pain pro-

duced by trigger points and is felt in the back of the thigh, the calf, and the sole of the foot. There may also be other abnormal sensations, such as numbness, tingling, burning, or hypersensitivity, in any of these areas. Trigger point referred pain and sciatic nerve entrapment can coexist, creating quite an array of symptoms. The relationship between the sciatic nerve and the piriformis is shown in figure 8.31 (Travell and Simons 1992; Hallin 1983).

For decades, the medical profession has known this collection of sciatic symptoms as “piriformis syndrome,” although the cause of the piriformis enlargement remained speculative. Surgical release of the muscle (cutting it in two) for the treatment of sciatica was once common. This operation is still performed by surgeons who are unaware of the effects of myofascial trigger points (Travell and Simons 1992; Shordania 1936).

A piriformis muscle that is shortened by trigger points can entrap numerous other nerves and blood vessels coming out of the pelvis, making all kinds of trouble. One result can be a sense of swelling in the buttocks, leg, calf, and foot. Even worse, a tight piriformis muscle can entrap the pudendal nerve, causing impotence in males and pain in the groin, genitals, or rectal area of either gender. Piriformis muscles compressing gluteal nerves and blood vessels are believed to be responsible for gluteal muscle atrophy, wherein one or both buttocks waste away (Travell and Simons 1992; Rask 1980).

Pain and all other symptoms caused by piriformis trigger points are commonly misinterpreted to be the result of inflammation of the sciatic nerve, intervertebral disk protrusion, arthritic spur formation, or spinal nerve root compression. While these problems can cause sciatic nerve compression, wider recognition of the myofascial causes of “piriformis syndrome” could eliminate unnecessary spinal operations (Travell and Simons 1992).

Causes

Quick changes of direction in sports activities such as tennis, handball, soccer, football, basketball, and volleyball constitute a special risk for the piriformis muscles. When you're not well conditioned for such activities, vulnerable muscles like the piriformis are the first to suffer. Work that requires twisting while lifting also can stress them unduly.

On the other hand, inactivity, especially too much sitting, can also promote the development of trigger points in piriformis muscles. In the young, piriformis trouble results from too much activity. In the old, it results from too little. Sacral iliac joint dysfunction is also known to create problems in the piriformis muscle.

Treatment

You must have a clear understanding of how to find the bony prominence of the greater trochanter to succeed in finding the piriformis muscle. If you're unsure, take another look at figure 8.22. Visualize the path of the muscle crossing on a slightly upward slant from just above the greater trochanter to the edge of the sacrum. To locate the piriformis by feeling it contract in isolation, you need to keep the gluteus maximus from contracting at the same time. You can do this by rotating your leg outward while lying down (figure 8.32). The exquisite tenderness of a trigger point in the piriformis will confirm its location.

There may also be trigger points in the other hip rotators found just below the piriformis. Search the area between the greater trochanter and the sit bone (*ischial tuberosity*). A good way to locate a sit bone is simply to sit on your hand. You will feel it.

As you can see in figure 8.31, the sciatic nerve, after leaving the pelvis, ordinarily passes beneath the piriformis, and then travels straight down the back of the leg. Prolonged or excessive pressure on the sciatic nerve can damage it. With self-treatment, such risks are minimal because of the immediate feedback you get when you're overdoing it. In massaging below the piriformis, you may inadvertently press on the sciatic nerve, in which case you will feel very uncomfortable electric sensations in your leg. Simply move the massage a tiny bit to one side. Unless the sciatic nerve is being entrapped or pinched somewhere else, you probably won't feel it at all.

Self-applied massage of the piriformis is done with a tennis, 60 mm high bounce, or lacrosse ball on the floor or against a wall (figure 8.33). Piriformis trigger points are hidden by the thickness of the gluteus maximus; some people prefer using the Thera Cane or Backnobber in bed. An elbow employed by a family member or sympathetic friend can really get to it.

Since part of the piriformis is inside the pelvis, a hidden trigger point may persist near the pelvic attachments after all the others have been taken care of. In this situation, you might attempt to gently lengthen the muscle (figure 8.34). Note that the foot is placed on the outside of the opposite leg. The opposite hand pulls on the knee. Don't attempt this stretch if you haven't succeeded in bringing the accessible trigger points below the level of exquisite tenderness. And go easy: don't forget that aggressive stretching can reactivate the trigger points you've just treated.

Intrapelvic massage with a gloved finger in the rectum or vagina can be done as a last resort for this interior piriformis trigger point when it fails to respond to stretching. Read the section on intrapelvic muscles in chapter 7 for more information. Intrapelvic massage can also be done by an experienced and knowledgeable physician or physical

therapist (Travell and Simons 1992; Thiele 1937).

A sacroiliac joint that's out of place can cause piriformis trigger points to come right back. In such a case, a manual adjustment of this joint by a chiropractor or osteopath may be required for permanent resolution of the problem. Often, however, an unstable pelvis will often resolve itself with successful inactivation of the trigger points in all the muscles that affect it, which would be most of the muscles discussed in this chapter and the next (Travell and Simons 1992; Lewit 1985).

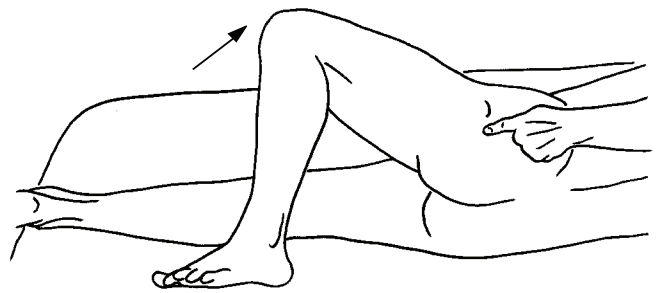


Figure 8.32 Move the knee strongly outward to locate the piriformis by isolated contraction

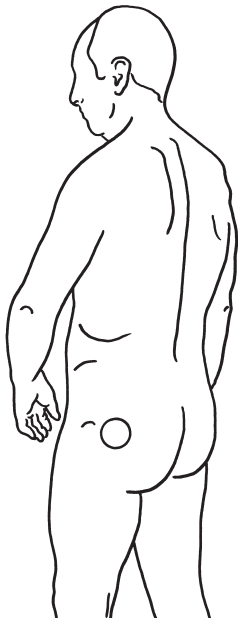


Figure 8.33 Piriformis massage with ball against a wall

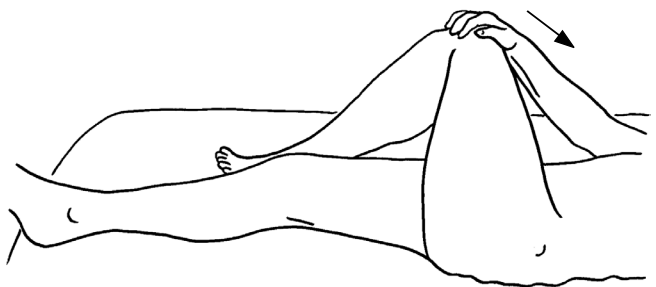


Figure 8.34 Piriformis stretch

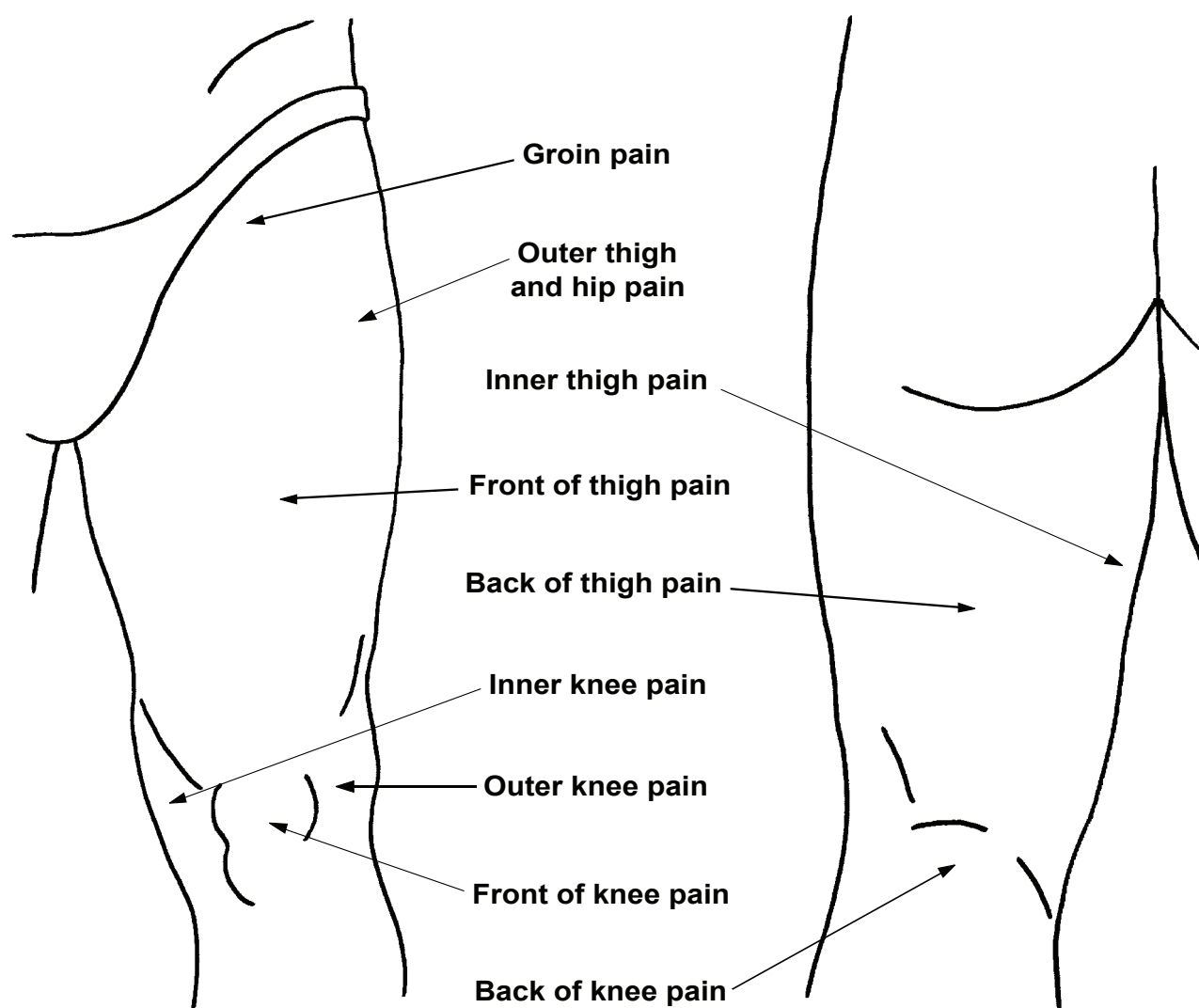
Moderate exercise is good for piriformis muscles when myofascial trigger points aren't handicapping them. Remember that trigger points shorten and weaken a muscle. In that condition, overstretching or overworking the muscle can quickly make its problems worse. Get rid of your trigger points before you get too serious about any exercise.

Finally, don't let anyone tell you that rest will solve the problem of myofascial pain. Inactivity is a classic perpetrator of trigger points.

You will find that sometimes the treatment doesn't seem to help immediately. The body needs time to change the chemistry at the trigger point. If you trust the process, massage the muscles you think are the problem, then go to bed. The pain will be better in the morning.

Chapter 9

Hip, Thigh, and Knee Pain



Pain Guide

Hip, Thigh, and Knee

Boldface type indicates a primary pain pattern. Regular type refers to a less common or satellite trigger point pattern. Muscles are listed in the order of how likely they are to be the problem. *Also see Other Symptoms Guide.* We've made these guides available for download at www.newharbinger.com/24946. See the back of the book for more information.

Back of Knee

gastrocnemius (267)
biceps femoris (120)
popliteus (242)
 semitendinosus (241)
 semimembranosus (241)
 soleus (270)
plantaris (244)

Back of Thigh

gluteus minimus (207)
semitendinosus (241)
semimembranosus (241)
 biceps femoris (120)
 piriformis (182)
 pelvic floor muscles (obturator internus) (181)

Front of Knee

rectus femoris (225)
vastus medialis (227)
adductor longus and brevis (234)

Front of Thigh

adductor longus and brevis (234)
psoas/iliacus (177)
adductor magnus (236)
vastus intermedius (227)
pectineus (233)
sartorius (218)
 quadratus lumborum (198)
rectus femoris (225)

Groin (also see Genital) Pain

pectineus (233)
adductor longus and brevis (234)
abdominal obliques (172)
psoas/iliacus (177)
rectus femoris (225)
tensor fasciae latae (220)

Inner Knee

vastus medialis (227)
gracilis (238)
rectus femoris (225)
sartorius (218)
adductor longus and brevis (234)

Inner Thigh

pectineus (233)
vastus medialis (227)
gracilis (238)
adductor magnus (236)
sartorius (218)

Outer Knee

vastus lateralis (229)

Outer Thigh and Hip

gluteus minimus (207)
vastus lateralis (229)
piriformis (182)
quadratus lumborum (198)
tensor fasciae latae (220)
adductor longus and brevis (234)
vastus intermedius (227)
gluteus maximus (201)
rectus femoris (225)

Other Symptoms Guide

Hip, Thigh, and Knee

Baker's Cyst (false)

biceps femoris (120)
popliteus (242)
plantaris (244)

Numbness or Tingling

Thigh

piriformis (182)
sartorius (218)

Pain or Trouble with Motion

Buckling (weak) Knee

vastus medialis (227)
vastus intermedius with
gastrocnemius (267)

Buckling Hip

rectus femoris (225)
vastus intermedius (227)

Crouching

popliteus (242)

Going Down Stairs or Hills

vastus medialis (227)
rectus femoris (225)
popliteus (242)

Going Up Stairs or Hills

vastus intermedius (227)
vastus lateralis (229)

Inability to Straighten Knee

vastus lateralis (229)
popliteus (242)
vastus intermedius (227)

Kicking toward Opposite Side (hip flexion and adduction)

pectineus (233)

Limping

gluteus minimus (207)
vastus lateralis (229)
vastus intermedius (227)
semimembranosus (241)
semitendinosus (241)
biceps femoris (120)

Locking Knee

vastus lateralis (229)

Lying on Your Side: Pain in the Top Hip

tensor fasciae latae (220)

Lying on Either Side

gluteus minimus (207)
tensor fasciae latae (220)
vastus lateralis (229)
adductor magnus (236)

Rising from a Seated Position

pectineus (233)
psoas/iliacus (177)
gluteus minimus (207)
vastus lateralis (229)
vastus intermedius (227)
semimembranosus (241)
semitendinosus (241)
biceps femoris (120)

Running: Behind the Knee

popliteus (242)

Sharp Pain or Tingling in Thighs

sartorius (218)

Sleeping: Interrupted by Pain

rectus femoris (225)
vastus medialis (227)
biceps femoris (120)
vastus lateralis (229)

Sitting: Hip

semimembranosus (241)
semitendinosus (241)
piriformis (182)
tensor fasciae latae (220)
biceps femoris (120)

Sitting: Lotus Position

pectineus (233)

Standing

sartorius (218)

Standing Up Straight

gluteus minimus (207)

Stinging Pain: Inner Thigh

gracilis (238)

Twisting at the Hip

adductor longus (234)

Walking: Hip

quadratus lumborum (198)
tensor fasciae latae (220)
sartorius (218)
gluteus minimus (207)
piriformis (182)
vastus lateralis (229)

Walking: Hip or Leg

semimembranosus (241)
semitendinosus (241)

Walking: Back of Knee

biceps femoris (120)

Phantom Limb Pain or Pain with Prosthetic

rectus femoris (225)
semimembranosus (241)
semitendinosus (241)
biceps femoris (120)

Pubic Stress Symphysis

pectineus (233)

Reduced Range of Motion

Abduction of Thigh (opening the legs)

adductor longus (234)
adductor magnus (236)
pectineus (233)

Crossing Legs

tensor fasciae latae (220)
piriformis (182)

Extension (taking long strides)

tensor fasciae latae (220)
psoas/iliacus (177)
pectineus (233)

**External Rotation of Thigh
(turning the feet and knees
out)**

- tensor fasciae latae (220)
- gluteus minimus (207)
- gluteus medius (204)
- adductor longus (234)

Inability to Touch Toes

- semimembranosus (241)
- semitendinosus (241)
- biceps femoris (120)

Knee Flexion

- vastus intermedius (227)

Tenderness

Hip

- tensor fasciae latae (220)

Thigh

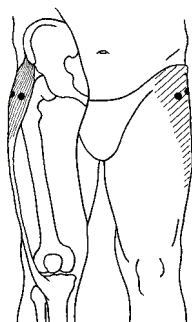
- tensor fasciae latae (220)
- vastus intermedius (227)
- vastus lateralis (229)

**Trochanteric Bursitis
(false)**

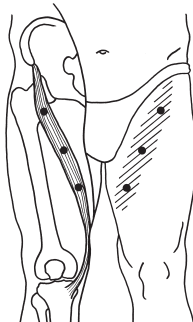
- tensor fasciae latae (220)
- gluteus minimus (207)
- vastus lateralis (229)

Pain Illustrations Guide

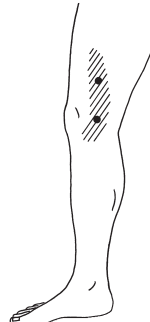
Hip, Thigh, and Knee



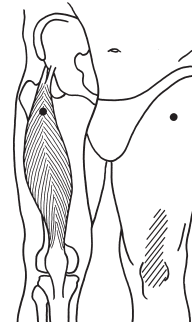
Tensor fasciae latae trigger points (in front and on the side) and referred pain pattern (p. 220)



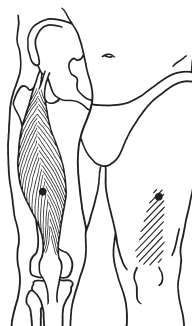
Sartorius trigger points and referred pain pattern (p. 222)



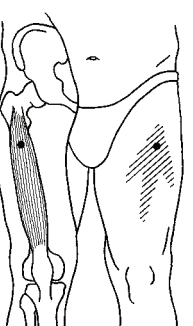
Sartorius referred pain pattern near the knee (p. 222)



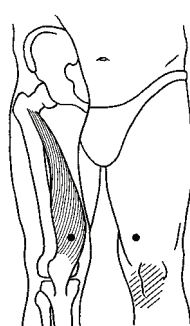
Rectus femoris number 1 trigger point and referred pain pattern (p. 225)



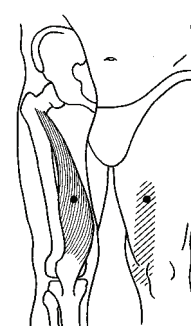
Rectus femoris number 2 trigger point and referred pain pattern (p. 225)



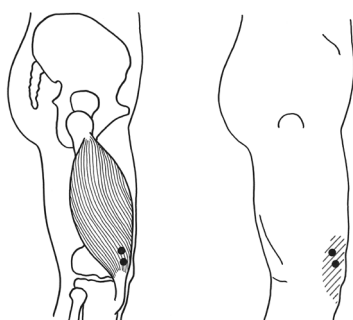
Vastus intermedius trigger point and referred pain pattern (p. 227)



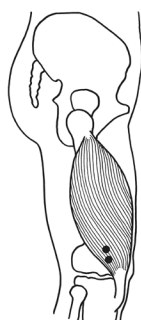
Vastus medialis number 1 trigger point and referred pain pattern (p. 229)



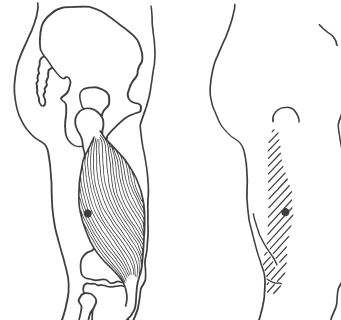
Vastus medialis number 2 trigger point and referred pain pattern (p. 229)



Vastus lateralis number 1 trigger points and referred pain pattern (p. 230)

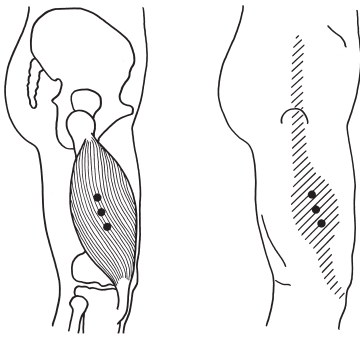


Vastus lateralis number 2 trigger points and referred pain pattern (p. 230)

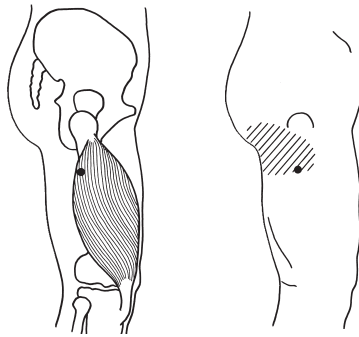


Vastus lateralis number 3 trigger point and referred pain pattern (p. 230)

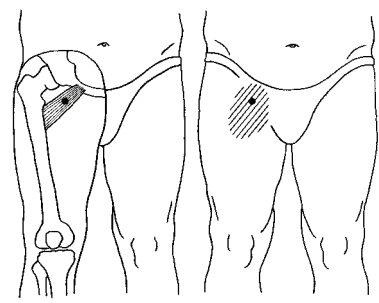
We've made this guide available for download at www.newharbinger.com/24946. See back of book for more details.
Caution: Please read the full treatment instructions for each muscle before beginning.



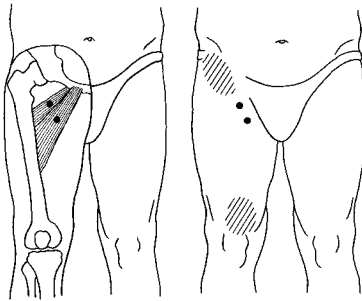
Vastus lateralis number 4 trigger points and referred pain pattern (p. 230)



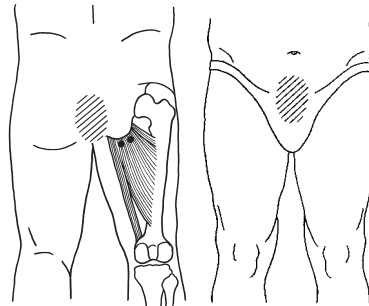
Vastus lateralis number 5 trigger point and referred pain pattern (p. 230)



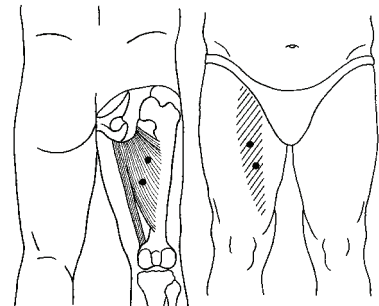
Pectineus trigger point and referred pain pattern (p. 233)



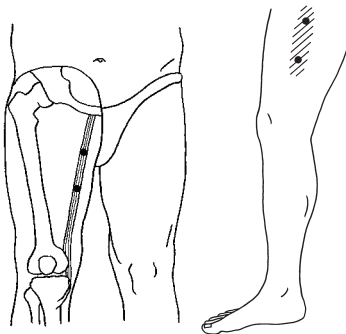
Adductors longus and brevis trigger points and referred pain pattern (p. 235)



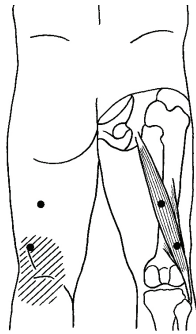
Adductor magnus number 1 trigger points and referred pain pattern (p. 237)



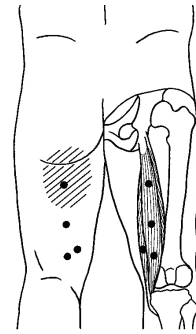
Adductor magnus number 2 trigger points and referred pain pattern (p. 237)



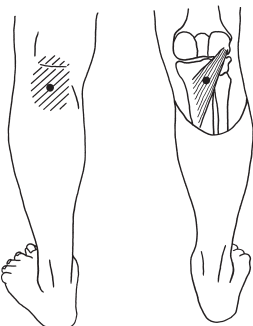
Gracilis trigger points and referred pain pattern (p. 238)



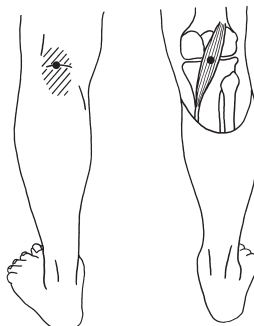
Biceps femoris trigger points and referred pain pattern (p. 240)



Semitendinosus and semimembranosus trigger points and referred pain pattern (p. 241)



Popliteus trigger point and referred pain pattern (p. 243)



Plantaris trigger point and referred pain pattern (p. 244)

Hip, Thigh, and Knee Pain

Pain in the hips and knees is a major source of disability, contributing to a diminished quality of life for a great number of people. When your knees and hips hurt, you quit participating in sports, stop exercising, and begin hiring others to get the yard work done. You stop going for walks on pleasant evenings. You foresee ending up in a wheelchair or having to use a walker or cane because of your bad knee or bad hip.

Arthritis, ligament injury, and deterioration of joint cartilage are the most usual medical explanations for hip and knee pain. X-rays and other tests often seem to substantiate such diagnoses. But even in the absence of objective evidence, joint pain itself is assumed to be proof that the joint is in trouble. As a consequence, hip and knee replacement surgery is commonplace and heavily promoted (Travell and Simons 1992).

Pain in hip and knee joints can sometimes be nothing more than referred pain from trigger points in the muscles of the thigh; such pain can be every bit as intense and debilitating as pain from a damaged joint. Even when a hip or knee joint has suffered a genuine injury, trigger points in associated muscles can contribute a major part of the pain. Treatment of joint trauma should always include treatment of trigger points in all nearby muscles. Look for trigger points first when you have pain in a hip or knee. You can take care of trigger points yourself.

The Guides at the beginning of this chapter are the key to locating the trigger points that cause your pain. Begin with the muscle at the top of the list for your pain and explore each one in turn. You may find that more than one muscle is involved. Read the chapter and observe your own body to learn how the individual muscles work in the various actions of the hip and knee joints. When you know what action has initiated the problem, you can often go right to the muscle that's causing most of the pain. It would also be a good idea to review table 3.1 "Self-Massage Guidelines at a Glance" in chapter 3, Treatment Guidelines, to be sure you're working the trigger points in the safest and most efficient way.

Tensor Fasciae Latae

Ignore the fancy Latin word endings in *tensor fasciae latae* (TEN-sur FAH-shuh LAH-tuh) (TFL). The name is commonly pronounced as shown. To perform its function, this muscle tightens (tensor) the wide sheet of fibrous tissue (fascia) that covers the outer side (lata) of the thigh. The fascia lata and its thick central tendon, the ilio-tibial (IT) band, or ITB, transmit the power of the tensor fasciae latae and gluteus maximus to the thigh and knee.

The tensor fasciae latae's job is to assist in bending the knee and the hip. It participates in raising the thigh forward or to the side and in rotating the leg inward. The tensor fasciae latae muscles help stabilize both the pelvis and knees during walking and running. In runners and other athletes, the tensor fasciae latae muscles are usually very highly developed. Sit-ups also require the action of these muscles.

Symptoms

Trigger points in the tensor fasciae latae (TFL) cause pain in the hip joint, just in front of the greater trochanter (figure 9.1). Occasionally, pain may extend down the outer thigh as far as the knee (not shown). You may also have a deep ache behind your hip, between the sit bone on that side and greater trochanter (not shown). The muscle shortening that is

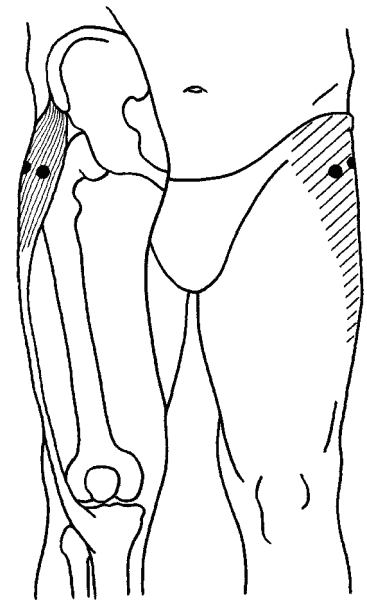


Figure 9.1 Tensor fasciae latae trigger points (in front and on the side) and referred pain pattern

sponsored by trigger points makes it difficult to straighten the hip. You may need to walk slowly because of the restriction in the hip. You tend to stand with both your hip and knee partly flexed. Leaning backward is almost impossible when tensor fasciae latae trigger points are at their worst (Travell and Simons 1992).

Be aware that tightness in the iliotibial band (IT band) on the outside of the thigh is due to tightness in the tensor fasciae latae and gluteus maximus muscles. Pain and tenderness at the head of the tibia (shinbone) on the attachment site of the IT band is also common. Pain at this spot worsens when going down stairs. This is diagnosed as iliotibial band friction syndrome. Massaging the trigger points of the tensor fascia latae and gluteus maximus will release the IT band. Apparent tenderness in the iliotibial band or side of the thigh is more likely coming from trigger points in the underlying vastus lateralis, which is part of the quadriceps (Waslaski 2012). This is a common mistake made by even the best of therapists.

The downward pull of a tight tensor fasciae latae on the front of your hip bone can tilt the pelvis forward and give you an excessive curve in your lower back. When only one side is involved it may make you appear to have a long leg. It can be difficult to lie on the affected hip because of its tenderness. Pain from trigger points in the tensor fasciae latae may be mistaken for trochanteric bursitis of the hip. It may also be wrongly blamed on a thinning of the hip joint cartilage (Travell and Simons 1992).

Ryan, age thirty, had such a stiff hip in the morning that he couldn't stand up straight until he'd walked around and stretched for several minutes. He had the same problem at noon after sitting all morning at his desk. His hip was stiff again at the end of the day and after riding any distance in the car. He could do his morning run only if he stretched well beforehand, but if he stretched too much or ran too hard, he got sharp stabs of pain in his hip and thigh. Trigger points high on the front and side of Ryan's hip were discovered to be the source of the stiffness in his hip. Self-applied massage before and after his early morning run soon freed up the restriction. He also found that stretching worked better if he massaged his hip first.

Causes

Too much walking, running, or climbing can overwork tensor fasciae latae muscles. After they've been overstressed, sitting tends to sponsor trigger points by keeping the muscles short. Sleeping with the knees up does the same thing. Tensor fasciae latae muscles are stressed even more by walking or running on uneven ground. They also work harder compensating for worn-out shoes or unstable ankles caused by Morton's foot, which is discussed in detail in chapter 10.

The tensor fasciae latae muscles are always working when you're on your feet. Walking with heavy loads can place needless strain on these muscles. Being overweight makes them work harder. When you have ongoing trouble with them, try to avoid prolonged sitting. If you tend to get stiff in your hips, be careful about sitting with your knees jackknifed up and try not to sleep curled up in a fetal position. Stiffness is a clear sign of the presence of latent trigger points. Overworking any muscle that contains latent trigger points can quickly activate them and lead to pain.

Treatment

To locate the belly of the tensor fasciae latae by isolated contraction, first find the ASIS (anterior superior iliac spine), or hip bone, that sticks out in front. You'll find this bony place right at the opening of the front pocket of your pants. Place a finger right below the hip bone and shift your weight from leg to leg. The muscle will alternately bulge and soften. Simply turning your knee or foot inward repeatedly also makes the muscle contract, as does raising your leg to the side. There can be two sites for trigger points: the first one is just an inch down and an inch

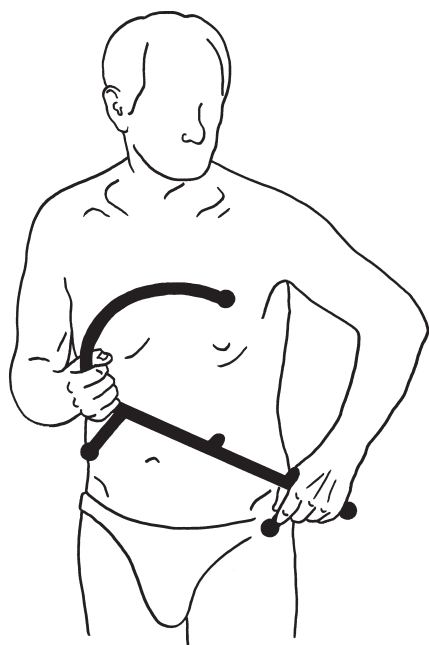


Figure 9.2 Tensor fasciae latae massage with Thera Cane

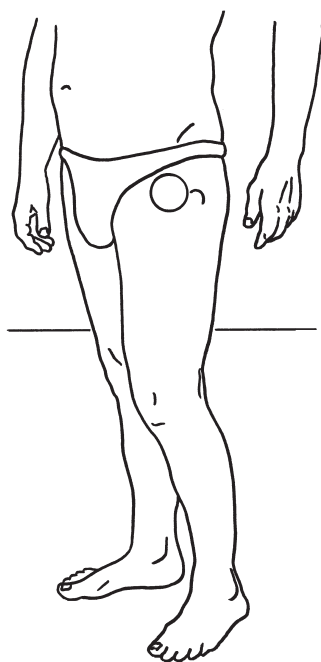


Figure 9.3 Tensor fasciae latae massage with ball against a wall

to the outside of the hip bone, and the second point is just one half to one inch further to the outside.

To massage this muscle, the Thera Cane is excellent (figure 9.2), or you can stroke the muscle deeply with a tennis, large high bounce, or lacrosse ball against a wall (figure 9.3). Trigger points can be deep in this thick muscle. Place the ball on the tensor fasciae latae, lean into the wall, and take the body weight off of the leg you are treating by slightly bending your knee. Just let this leg hold its own weight. Roll the ball across the muscle fibers or along them, whatever feels better to you.

Several other muscles are usually in trouble along with the tensor fasciae latae. When there's pain or stiffness in a hip, troubleshoot all the muscles listed in the Pain Guide for "Outer Thigh and Hip Pain."

Sartorius

The *sartorius* (sar-TOR-ee-us) is the longest muscle in the body. The word comes from the Latin for "tailor." In olden times, tailors often sat in a cross-legged position to do their work. Strong action of the sartorius muscles is needed to get the legs into this posture. The sartorius attaches to the hip bone, then descends, crossing the thigh toward the inner side, and attaches again to the tibia on the inner side of the knee. (The tibia is the larger of the two bones in your lower leg.) This arrangement allows the sartorius to participate in raising the leg forward and turning the knee outward. A soccer kick requires strong contraction of the sartorius.

This long muscle is interrupted in several places by strips of connective tissue that break the long muscle fibers into short ones. Each section of muscle has its own belly, creating the possibility of trigger points anywhere along the muscle's entire length.

Symptoms

Trigger points in the sartorius create only localized pain. It can occur anywhere along the muscle on a track that crosses the thigh from the hip bone in front to the inner knee (figures 9.4 and 9.5). The pain doesn't have the deep aching quality that usually typifies myofascial

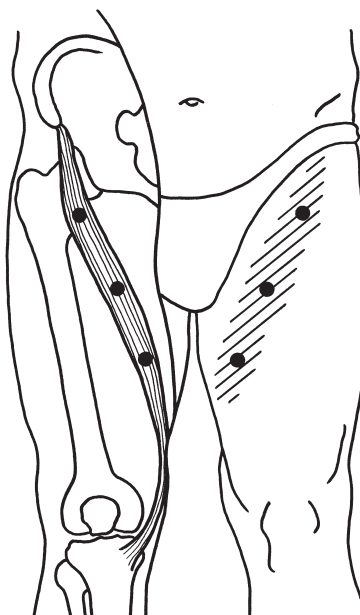


Figure 9.4 Sartorius trigger points and referred pain pattern

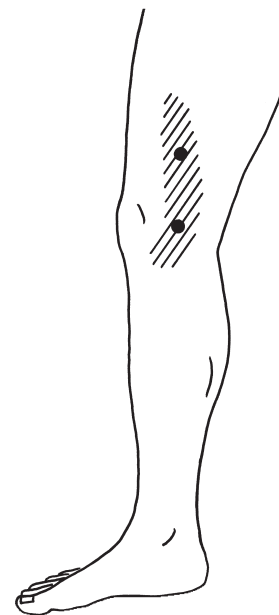


Figure 9.5 Sartorius referred pain pattern near the knee

pain. It's felt instead as a sharp, sudden pain or as a burning and tingling sensation just under the skin. A quick movement or excessive extension of the hip (putting the leg too far back) is apt to cause a sharp jab of pain right around the trigger point. Simply sitting down, which slackens the sartorius muscles, can give temporary relief of the symptoms. Standing can make the symptoms worse by keeping the muscles taut (Travell and Simons 1992).

Sartorius trigger points cause a more superficial sharp or tingling pain in the knees; they can make the inner knees so hypersensitive to pressure that it's uncomfortable to lie on your side with your knees together. This sensitivity can lead to the mistaken assumption that you have something wrong with your knee joints (Travell and Simons 1992).

Compression of sensory nerves by a tight sartorius muscle can also cause superficial burning pain, numbness, itching, and tingling in the skin of the front and outer thigh. This is not referred pain but rather a direct effect on a nerve. These symptoms are often called "meralgia paresthetica," which is a fancy way of saying that you have numbness and pain in your leg. Look for trigger points in the sartorius if you're experiencing these symptoms (Travell and Simons 1992).

Causes

A sudden, vigorous twisting movement with the foot planted can initiate trigger points in the sartorius. They may also be caused by a twisting fall. Maintaining some yoga positions and keeping the legs up while sitting or sleeping encourage the development of trigger points in sartorius muscles. Morton's foot and an elevated first metatarsal (discussed in chapter 10) cause an excessive pronation of the foot. This leads the knee to bend inward in a knock-kneed position, causing the sartorius to remain chronically overstretched and susceptible to developing trigger points.

To keep the sartorius out of trouble, avoid extreme extension of the hip when your muscles are tight or cold. Overextension occurs when you take unusually long strides or make an unusual twisting movement. Extreme efforts in athletics can overcontract, overstretch, or overwork any muscle, including the sartorius. Be circumspect about vigorous activity when you're out of shape. Any strains or overuse that cause trigger points in other hip muscles can have a secondary effect on the sartorius. Sartorius muscles are rarely in trouble by themselves. Other muscles usually involved are the rectus femoris, vastus medialis, psoas, tensor fasciae latae, gluteus medius and minimus, piriformis, and the adductors of the inner thigh.

Treatment

Locate the sartorius by feeling it contract when you do the combined movement of hip flexion and lateral rotation (figure 9.6). This action lifts the leg forward and turns the knee outward. The muscle will contract even harder if you also move the whole leg to the outside.

Search all along the muscle, from the front of the hip to the inner knee. Massage trigger points with supported fingers in slow, deep circles, making sure to avoid the femoral artery, just medial of the fingers shown in figure 9.7. Paired thumbs are also effective. Note that the sartorius crosses the vastus medialis. Both muscles are often involved together and can be worked at the same time with the same techniques.

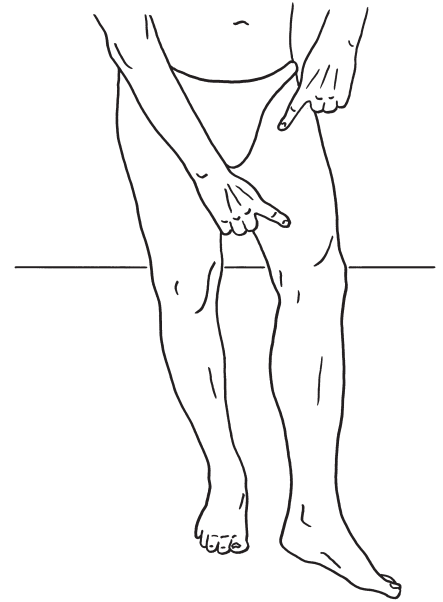


Figure 9.6 Locating sartorius with isolated contraction by turning the thigh outward and raising the leg forward



Figure 9.7 Sartorius massage with supported fingers (avoid the artery just medial of this muscle)

Quadriceps Muscles

Anatomically, the *quadriceps* is a single muscle with four heads, although only three are visible in figure 9.8. The quadriceps covers the front and outer thigh and part of the inner side, wrapping almost three-quarters of the way around the upper leg. All four heads of the quadriceps attach to the kneecap by way of a common tendon. The kneecap, or patella, is entirely enclosed within this tendon and moves with it. Free movement of the kneecap is fundamental to free operation of the knee joint. Trigger points in any of the quadriceps heads can inhibit this freedom and cause the kneecap to be pulled up or to one side. Trigger points can also form as a reaction in the overstretched opposite muscle as well as create a strain at the attachment of the tendon (Waslaski 2012). The common tendon attaches to the top of the tibia, allowing the quadriceps muscles to straighten the knee. An additional function of the *rectus femoris*, the frontmost part of the quadriceps, is to help flex the hip.

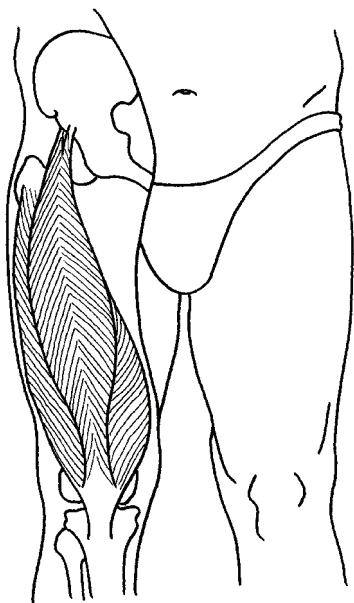


Figure 9.8 Quadriceps muscle

The quadriceps muscles are the largest, heaviest, and most powerful muscles in the body. Quadriceps trigger points are the primary source of knee pain. A case of jumper's or runner's knee is often nothing more serious than referred pain from the quadriceps. Growing pains in the legs and knees of children can be traced to trigger points in their quadriceps muscles. Quadriceps trigger points may also cause the phantom knee pain felt by amputees who no longer have their knees. Restless leg syndrome, a serious annoyance to its victims and a mystery to their doctors, can be blamed on trigger points in quadriceps muscles. Knots in the quadriceps can also cause a locked knee, a trick knee, or a buckling hip (Travell and Simons 1992).

Pain and weakness from quadriceps trigger points are easily mistaken for patellar tendinitis, bursitis, or arthritis of the knee, or assumed to be from damaged ligaments or meniscus cartilage. True patellar tendinitis is rare and is accompanied by signs of inflammation, including redness and swelling. Pain at the attachment of the patellar tendon may more appropriately be called patellar tendinosis. Tendinosis is simply another way of saying there is irritation and pain at the attachment of the tendon to bone. An imbalance of tension between the quadriceps muscles in the front and hamstrings on the back of the thigh can be responsible for the constant pulling and pain just below the kneecap. Releasing the trigger points and tension in the muscles can relieve this condition. Treatment is unlikely to succeed when the problem is wrongly assumed to be in the joint simply because it's the site of the pain (Travell and Simons 1992; Waslaski 2012).

Knee pain can be extremely debilitating and yet unimaginably easy to get rid of when you understand what's really going on.

At age forty-six, Kurt's latest crisis with his knees made him stop in the middle of mowing his lawn because of the unbearable pain it was causing. He went inside to sit down and rest, but when he stood up again he could barely walk across the room. He'd had recurrent trouble with his knees for twelve years, ever since climbing a mountain in the Adirondacks. His knee pain had begun on the descent and had gotten so bad that he'd been able to continue walking only with the aid of friends. At a medical center, he had been told he'd eventually need both knees replaced, because X-rays showed thinning of the joint cartilage.

Kurt's crisis with lawn mowing motivated him to call a friend who had been studying trigger points. Over the phone, his friend helped him find horribly painful knots in his thigh muscles. Kurt was actually able to knead the knots with one hand while they talked. When he hung up the phone, he found that he could get up and walk across the room with greatly diminished pain. Daily self-applied massage of his quadriceps muscles over the next few weeks ended the twelve-year-long problem with his knees.

The quadriceps muscles are commonly abused by overexercise or overexertion in sports activities, or by carrying heavy loads, walking in high heels, climbing, jumping, kneeling, and squatting. Working all morning in the garden can really get them into trouble. A job that gets you up and down continually all day will quickly overtax the quadriceps muscles. Keep in mind that favoring other muscles of the hip and thigh due to trigger points can place increased stress on the quadriceps.

For the purpose of tracing specific pain to specific trigger points, the four heads of the quadriceps will be treated as four separate muscles.

Rectus Femoris

The *rectus femoris* (REC-tus FEM-or-iss) muscle is found on the front of the thigh and runs straight from the hip bone to the knee. *Rectus* in Latin means “kept in a straight line.”

The rectus femoris muscle attaches, along with the other quadriceps muscles, to the common tendon at the knee, which allows it to participate in extending (straightening) the knee. The other attachment of the rectus femoris is to the pelvis, which makes the muscle a powerful flexor of the hip; it helps you raise your leg or sit up in bed. The dual function of the rectus femoris leaves it vulnerable to types of abuse that have little effect on the other heads of the quadriceps. Symptoms of rectus femoris trigger points are so far removed from the cause that few people would ever make the connection, as illustrated by one young woman’s experience with them.

After walking around in platform heels all afternoon at a craft fair, Rene, age twenty-two, felt strong pulling pain under her kneecaps. She thought if she could just get under her kneecaps, she could fix it. She always had problems with her knees, especially when walking up hills or stairs, but she didn’t know why. She wasn’t athletic and she’d never strained her knees that she knew of. Rene’s knee pain turned out to be from trigger points in her rectus femoris muscles in the front of her thighs. Deep massage of these muscles stopped the pain under her kneecaps in less than a minute. A massage therapist told her that her leg muscles were weak and lacked stamina from too much sitting and not enough exercise. Walking in high heels added to the strain on her thigh muscles; this strain quickly tired the muscle and was the immediate cause of the trigger points.

Symptoms

The most common trigger point in the rectus femoris muscle refers pain deep inside the knee; this pain is usually described as feeling like it’s under the kneecap (figure 9.9). Walking up stairs or hills can be painful and cause the knees to crackle and pop. This trigger point can cause a buckling hip that unexpectedly gives out when walking. A second trigger point is sometimes found above the knee. This trigger point causes a deep ache above the knee, local to the trigger point (figure 9.10). Both these trigger points make the knees stiff and weak. Pain in the leg and knee may wake you up at night (Travell and Simons 1992).

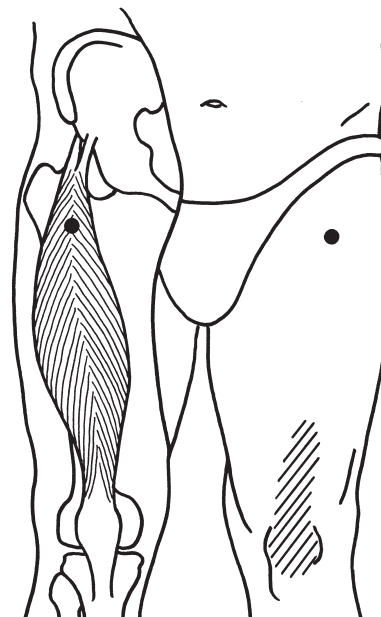


Figure 9.9 Rectus femoris number 1 trigger point and referred pain pattern

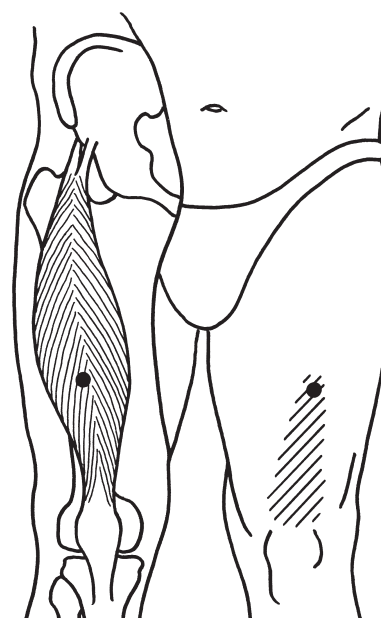


Figure 9.10 Rectus femoris number 2 trigger point and referred pain pattern

Causes

Sitting for long periods of time keeps the rectus femoris shortened, a condition that promotes trigger points. Overdoing any activity that requires strong or repeated hip flexion can put the rectus femoris muscles in jeopardy. For this reason, climbing, cycling, running, and fast walking are rough on them, as are sit-ups and leg lifts. It is easy to overuse these muscles when doing many Pilates exercises. Kicking a football or soccer ball calls for strong action of the rectus femoris. Even the flutter kick in swimming can be an unsuspected cause of knee pain from rectus femoris trigger points.

Walking in high heels or wedge-soled shoes is a frequent, unsuspected cause of trigger points in rectus femoris muscles. You may not want to stop wearing stylish shoes just because someone says they're bad for you, but knowing they may be causing your knee pain at least gives you the option of compensating at the end of the day with some well-placed massage.

If your knee pain comes from athletic activities, you don't have to wimp out and cut back. Just be smart enough to do some preventative maintenance on your quadriceps before and after every session. If you stretch for this purpose, do trigger point massage first; otherwise, the muscles may resist stretching and won't completely release.

Treatment

Locate the rectus femoris by feeling it contract when you raise your leg. Notice that it contracts much harder with a straight knee than with it bent; this is because of the muscle's dual function. Feel for the hip bone right at the opening of the front pocket of your pants. This is called the ASIS, or anterior superior iliac spine. While standing, take your hand and measure one hand's width down from the ASIS. A hand's width is across the palm from thumb to pinky. While standing, the uppermost trigger point will be just below your hand. The lower trigger point is one hand's length up from the top of the kneecap. A hand's length is the distance from the tip of your middle finger to your wrist. It is interesting that these "handy" measurements are proportional no matter your height.

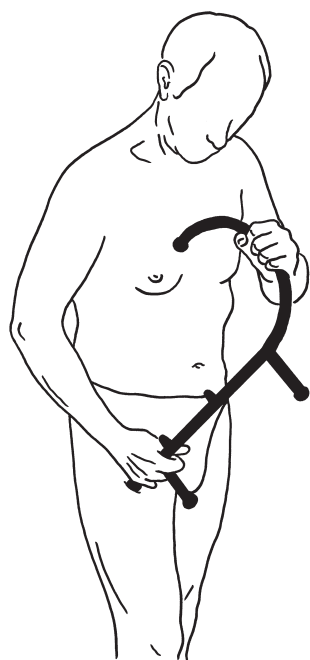


Figure 9.11 Rectus femoris massage with Thera Cane

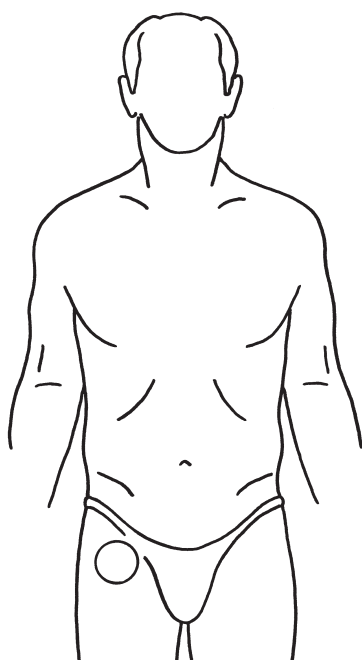


Figure 9.12 Rectus femoris massage with ball against a wall

Massage the rectus femoris with paired thumbs while standing or sitting. Supported fingers are awkward for massaging trigger points near the hip (they offer poor leverage), but they work well on the lower part of the muscle. The Thera Cane is a good tool to use in either place (figure 9.11). A tennis ball, large high bounce ball, or lacrosse ball against a wall is great since you have the advantage of using your body weight for pressure (figure 9.12). While standing to massage this muscle, keep the majority of your weight on the opposite leg.

Be aware that trigger points may be found in other muscles near the hip, including the tensor fasciae latae, sartorius, and pectineus. Any of these can weaken the hip enough to give way when you put your weight on it. It's useful to be able to tell them apart. Learn to find the muscles individually by contracting them in isolation. Your work will be more successful when you know exactly where everything is.

Vastus Intermedius

The *vastus intermedius* (VAST-us in-ter-MEE-dee-us) muscle lies hidden beneath the rectus femoris and is equal to it in size. Overuse of the knee is the primary cause of trigger points in the vastus intermedius. Too much climbing or overexercise of the quads at the gym typically makes trouble for this muscle.

Pain from trigger points in the vastus intermedius is characteristically felt in the midthigh, spreading and radiating down from the trigger point, occasionally as far as the knee (figure 9.13). Pain increases when you walk, and increases dramatically when you climb stairs. You may have trouble straightening your knee when you stand up after sitting for a long while. Stiffness in the knee may cause you to limp.

Being completely covered by the rectus femoris, the vastus intermedius is difficult to locate by isolated contraction. Search the front of the thigh about a hand's length down from the hip bone (ASIS). Remember that a hand's length is the distance from the tips of your fingers to your wrist. It's sometimes possible to push the rectus femoris to the inside to get to the vastus intermedius if the muscles are relaxed. Paired thumbs (figure 9.14), supported fingers, or the Thera Cane work well for massage. A tennis ball, large high bounce ball, or lacrosse ball against the wall are good, too.

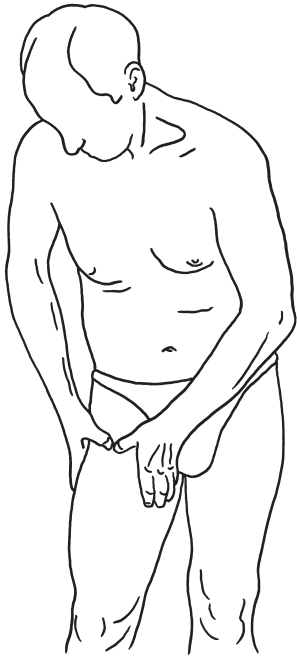


Figure 9.14 Vastus intermedius massage with paired thumbs

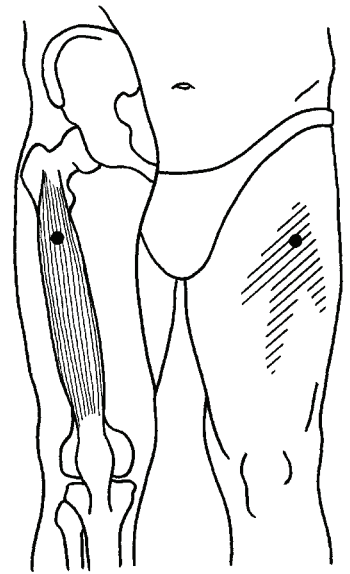


Figure 9.13 Vastus intermedius trigger point and referred pain pattern

Vastus Medialis

The *vastus medialis* (VAST-us mee-dee-AL-iss) is the muscle that forms the oval bulge toward the inner side of the thigh just above the knee. The vastus medialis attaches to the femur and to the kneecap and tibia through the common patella tendon. The vastus medialis is often weaker than and overpowered by the vastus lateralis, which pulls the kneecap to the outside (Waslaski 2012).

Problems caused by vastus medialis trigger points commonly affect runners.

Linda, age fifty-three, had a right knee that tended to give way unexpectedly. She occasionally fell when walking or running and had once broken her wrist. Pain in her knees and the risk of falling had caused her to give up jogging.

Extremely tender trigger points were found in the quadriceps muscles of both of Linda's legs. Her vastus medialis muscle was especially bad in her right leg, the one that was so prone to collapse. Regular massage to her quadriceps, with special attention to her right vastus medialis, put an end to her buckling knee and enabled her to begin running again.

Symptoms

Trigger points in the vastus medialis send pain to the inner thigh and to the knee (figures 9.15 and 9.16). The knee pain usually focuses in the lower half of the knee a bit to the inside. Vastus medialis trigger points typically make the knee weak; a buckling knee, in fact, is their signature. Pain from these trigger points may keep you awake at night. People who are elderly or overweight are at great risk for falling when a “trick knee” gives way (Travell and Simons 1992). These are important trigger points to know for emergencies where you have to go down a lot of stairs at once or downhill quickly. Pain and weakness can come on unexpectedly.

Knee pain and weakness caused by vastus medialis trigger points are frequently mistaken for signs of arthritis, ligament damage, and tendinitis. Ice, rest, and painkillers are typical remedies prescribed for knee pain, although none have any direct effect on trigger points. If overdone, physical therapy for knee pain in the form of exercise and stretching can make vastus medialis trigger points worse, increasing your symptoms (Travell and Simons 1992). Once the trigger points are deactivated in all of the quadriceps muscles and normal muscle length is restored with stretching the vastus lateralis and tensor fasciae latae muscles, strengthening the vastus medialis will solve the problem. Rebalancing the vastus medialis and vastus lateralis and unloading the tension on the rectus femoris are the keys to resolving patellar tendinosis and chondromalacia, which is pain and a grating sensation under the knee cap (Waslaski 2012).

Causes

As with the other quadriceps muscles, overload causes trouble for the vastus medialis. Deep knee bends and running are two activities that commonly overwork vastus medialis muscles. The vastus medialis has to contract and lengthen at the same time when squatting or going down hills and stairs. This type of action is called *eccentric contraction*. Trigger points are often caused when muscles are overloaded with this type of contraction. Unstable ankles due to Morton’s foot also adversely affect these muscles. (See more about Morton’s foot in chapter 10.) Walking with the ankles fallen inward (pronation) or the feet turned outward are signs of this condition (Travell and Simons 1992).

Prevent accidental falls caused by a trick knee by keeping up with your vastus medialis trigger points. This sort of preventative maintenance has many benefits. Trigger points keep a constant low-grade tension on muscles that is believed to eventually damage their attachments at the joints. You can help prevent deterioration of your knee joints by keeping your quadriceps muscles free of trigger points.

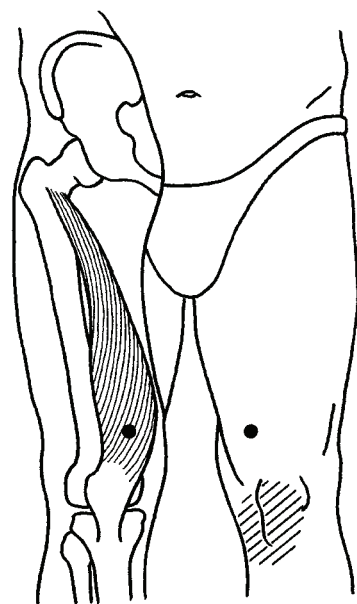


Figure 9.15 Vastus medialis number 1 trigger point and referred pain pattern

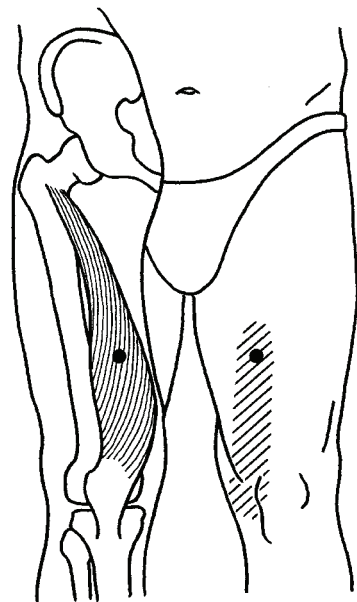


Figure 9.16 Vastus medialis number 2 trigger point and referred pain pattern

To help re-establish normal resting length to muscles, perform a muscle's action three times after doing trigger point massage. For the knee, that would mean fully bending and straightening it.

Treatment

Find the lower trigger point by measuring a hand's width up from the top of the kneecap. The trigger point will be about halfway between the inner side of the thigh and the front of the thigh. The upper trigger point is about a hand's length up from the top of the kneecap and just slightly medial (or toward the inside) of the front of the thigh. Paired thumbs work well for massage of the vastus medialis (figure 9.17). Supported fingers or any handheld massage tool are good, too. You can also do excellent deep massage with an elbow while sitting on the edge of a bed or chair. With the vastus medialis, massage done when symptoms first appear can get rid of pain surprisingly fast. Give the trigger points ten to twelve deep strokes several times a day.

In an emergency, you can pinch the skin over the vastus medialis to temporarily inhibit pain or weakness in the knee—long enough to get you out of the path of a raging bull. Elastic knee braces use this same effect in squeezing or putting pressure on the muscle. Knee supports, however, have little curative effect. If you're prone to having a buckling knee, check for trigger points every day. Latent trigger points don't cause pain but can still be the cause of dangerous knee weakness.



Figure 9.17 Vastus medialis massage with paired thumbs

Vastus Lateralis

The *vastus lateralis* (VAST-us la-ter-AL-iss) covers the entire outer side of the thigh, from the greater trochanter in the hip to the knee, attaching to the kneecap and tibia through the common quadriceps tendon. It also wraps around the femur to cover part of the front and back of the thigh. It's the largest muscle of the quadriceps group, much larger than you may suspect. It's also the source of a surprising amount of trouble, as exemplified by Chuck's story.

Chuck, thirty-one, had been an athlete all through school, and was an avid skier and rock climber as an adult. Now he had chronic knee pain and both knees had been known to lock (fortunately never at the same time). His knee difficulties were keeping him on the sidelines, annoyed and impatient with his condition. He couldn't even enjoy a little half-court basketball with his friends.

Luckily, the girlfriend of one of Chuck's friends happened to know something about trigger points. She showed him how to look for myofascial knots in his legs that might be causing his knee trouble. Within minutes, he had discovered several very painful spots in his outer thighs that hurt like crazy when he pressed them. To his amazement, the self-applied massage technique she showed him immediately began to relieve his pain. In just a couple of weeks of working every day on his knots, he was able to return to his athletic activities, essentially pain free.

When there are multiple muscles involved in your pain problem and the trigger points are extremely tender, remind yourself to simply improve the circulation at the trigger point. It will get progressively better. It just takes a *little* while, but not long.

Symptoms

Trigger points in the vastus lateralis can make the hip and outer thigh hurt, and they're an exceptionally common source of knee pain (figures 9.18, 9.19, 9.20, 9.21, and 9.22). Trigger points in the muscle's back edge can cause pain behind the knees and in the back of the hip (Travell and Simons 1992).

Vastus lateralis trigger points are very common in children and probably account for much of their unexplained thigh and hip pain. "Growing pains" may be undiagnosed myofascial pain that would have a very simple remedy if it were only recognized (Travell and Simons 1992).

Walking can be exceedingly painful with afflicted vastus lateralis muscles. Lying on your side can be very uncomfortable. Sleeping may be disrupted by turning on your side. Tension in the muscle can pull the kneecap to the outside, locking it in place and preventing movement in the knee. A locked

knee is usually due to a trigger point just above and to the outside of the kneecap.

The normal position of the kneecap is maintained by balanced action of the vastus medialis and lateralis muscles.

Trigger points in the vastus medialis can weaken its counterbalancing effect on the vastus lateralis and may be of central concern in treating a locked knee (Travell and Simons 1992).

The vastus lateralis is responsible for the tenderness you feel when massaging the side of the leg with a stick-like tool like The Stick or Tiger Tail, or rolling your leg on a foam roller. Many athletes and even physical therapists wrongly blame this

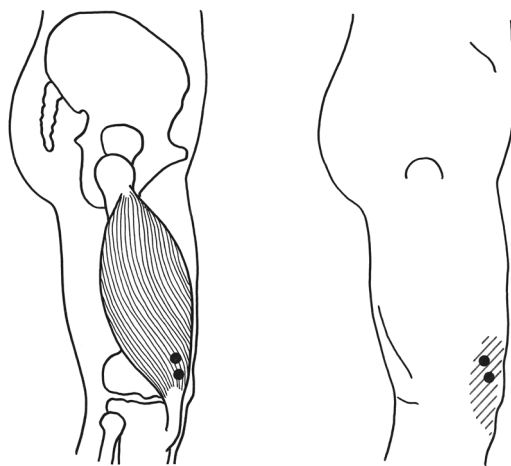


Figure 9.18 Vastus lateralis number 1 trigger points and referred pain pattern

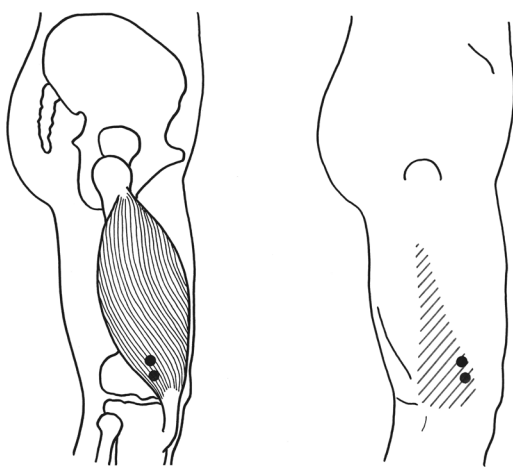


Figure 9.19 Vastus lateralis number 2 trigger points and referred pain pattern

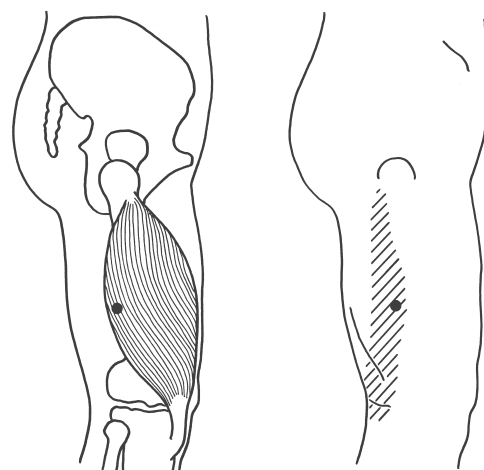


Figure 9.20 Vastus lateralis number 3 trigger point and referred pain pattern

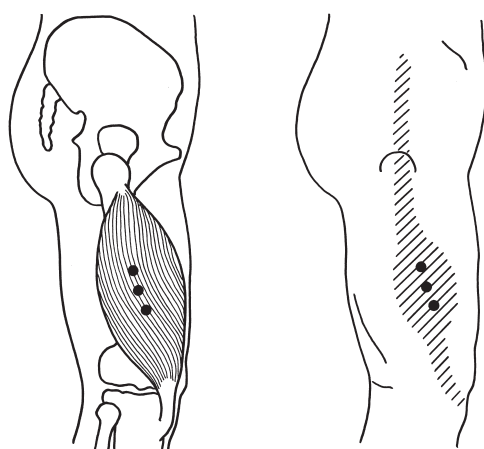


Figure 9.21 Vastus lateralis number 4 trigger points and referred pain pattern

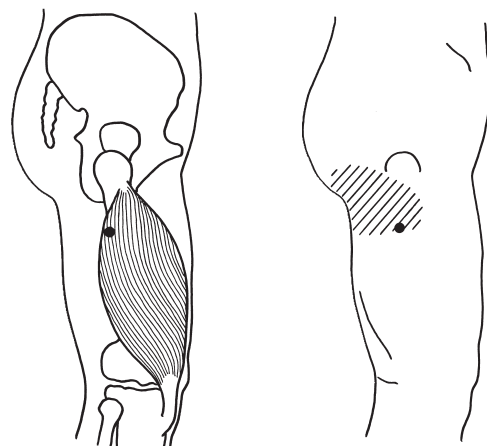


Figure 9.22 Vastus lateralis number 5 trigger point and referred pain pattern

hypersensitivity on a tight IT band. When the IT band is in trouble, it is important to focus the massage at the tensor fasciae latae and gluteus maximus. Pain from trigger points in the vastus lateralis can be satellites of points in the tensor fasciae latae or gluteus minimus, or from sciatic nerve impingement.

Causes

Overdoing any activity involving the legs, such as running, cycling, in-line skating, or skiing, can set up trigger points in the vastus lateralis, and the effects are often felt in the knees. Because overload of the quadriceps is produced by so many kinds of activity, latent trigger points in the vastus lateralis are present in many people, though very rarely recognized. A direct blow to the muscle can set up trigger points. Keeping the leg straight and immobilized can do the same. Ironically, a knee brace or splint meant to be therapeutic by keeping the knee from bending can actually perpetuate trigger points in the vastus lateralis. After recovering from an injury to the leg or knee, you will find it important to search out and massage trigger points in your quadriceps muscles.

Treatment

As seen in figures 9.18 through 9.22, vastus lateralis referred pain patterns are very diverse. To find the trigger point at the knee, locate the cable-like iliotibial (IT) band on the side of the thigh just above the knee. The trigger points in figure 9.18 are located just above the joint in front of the IT band. On the back side of the IT band, and before you reach the tendon of the lateral hamstrings, lie the points illustrated in figure 9.19. Note that these points refer pain on the side and back of the knee. All four of these lowest trigger points are easily massaged with supported fingers or any handheld massage tool like a Knobble. Pull toward yourself over the trigger point. Higher up the leg, adequate leverage is hard to attain with the fingers. An excellent way to massage the central part of this muscle is to lie on your side with a tennis ball under the thigh (figure 9.23). Move the leg forward and back to execute the stroke. When you are awakened in the night by aching thighs, this gives enough relief to go right back to sleep. The Thera Cane, Backnobber, Knobble, foam roller, or the ball on a wall are all great tools for the vastus lateralis (figures 9.24 and 9.25). Raking the thigh with the knuckles also can be quite effective when the other hand is put on top to double the pressure. Be sure not to miss trigger points along the back edge of the muscle, which is on the back of the thigh. Some vastus lateralis trigger points are very deep.

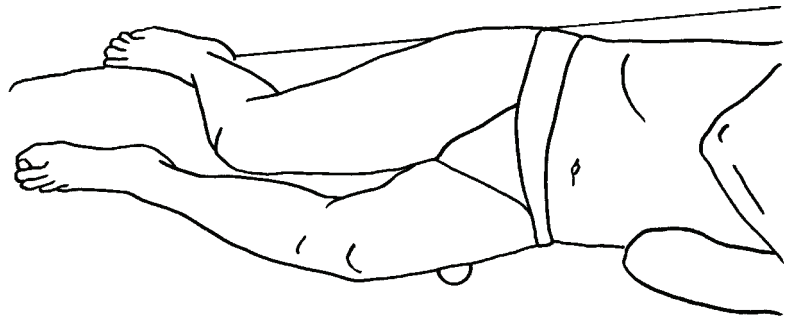


Figure 9.23 Vastus lateralis massage lying on side with ball. Move the leg forward and back over the ball.

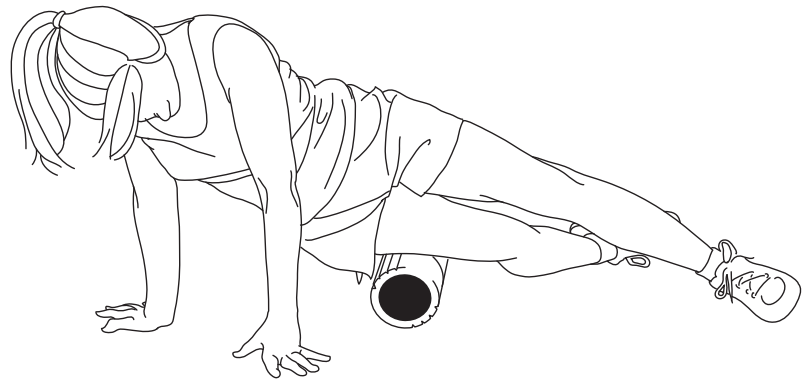


Figure 9.24 Vastus lateralis massage with a foam roller

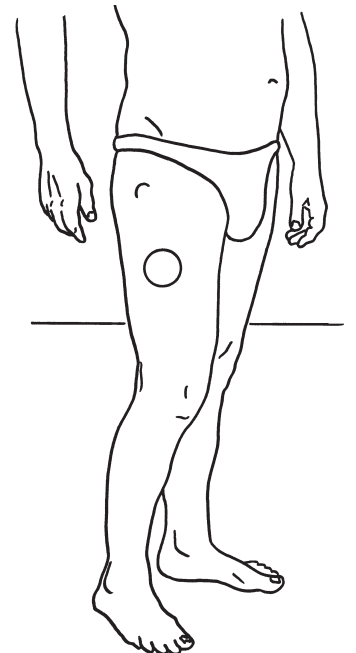


Figure 9.25 Vastus lateralis massage with ball against a wall

Among athletes, amateur and professional, the ability to find and massage trigger points in their legs should be considered an essential skill. Self-applied massage is a valuable complement to stretching for loosening and warming up the muscles before or after exercise. Self-applied massage can help prevent athletic injuries because it directly addresses the trigger points that keep muscles shortened and vulnerable.

Inner Thigh Muscles

The inner thigh is heavily muscled and highly susceptible to the kinds of muscle strain that can establish myofascial trigger points (figure 9.26). Unfortunately, the inner thigh is unexplored territory for most people, and trigger

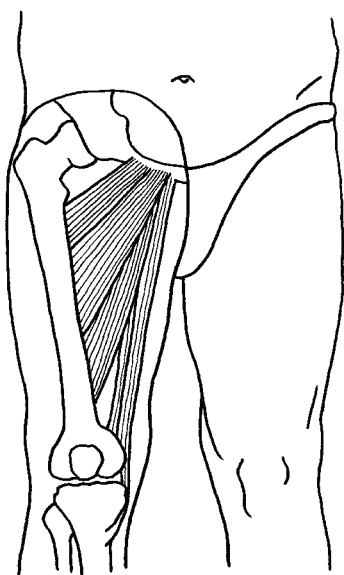


Figure 9.26 Inner thigh muscles

points typically go undetected and untreated. Even professional massage therapists neglect working on the inner thighs because it seems so invasive. Yet trigger points in the muscles of the inner thigh are extraordinarily common and cause many worrisome problems that are frequently misdiagnosed. Women have a risk of straining these muscles during sexual activity, by both overstretching and overcontracting them (Travell and Simons 1992).

Trigger points high in the inner thigh are of special concern because their pain is felt in the hip joint and deep inside the pelvis. These trigger points can cause painful intercourse for women, leading them to fear they have rectal, bladder, or gynecological problems. When men have these same trigger points, they're likely to believe they have rectal, bladder, prostate problems, or an inguinal hernia. Pain from inner thigh trigger points is often misread as indicating arthritis of the hip or knee joints (Travell and Simons 1992).

The familiar "groin pull" experienced by athletes, dancers, and gymnasts comes from trigger points in muscles of the inner thigh. When your feet move far apart during an accidental slip on the ice, the inner thigh muscles are very likely to be strained. Pain from trigger points in these muscles is felt in the inner thigh itself. Sometimes it extends as far as the knee and shin (Travell and Simons 1992).

The muscles of the inner thighs function primarily to move the legs toward one another or to cross one over the other, an action called adduction. (Remember the word by thinking of adding one leg to the other.) The inner thigh muscles are important in helping to stabilize the hip during walking and running. These muscles are employed vigorously when you go skating, skiing, or horseback riding (Travell and Simons 1992).

Trigger points in the inner thigh muscles can be initiated by something as seemingly harmless as getting in and out of a car or taking overly long strides. Sitting in deep car seats or sitting with the legs crossed can promote shortening of the inner thigh muscles, which can set up trigger points. Arthritis of the hip often sponsors trigger points in the inner thigh muscles. Persistent pain after hip surgery can be due to trigger points in nearby muscles of the thigh (Travell and Simons 1992).

Trigger points are not hard to find in the inner thighs; this area can be especially tender. Get to know the five muscles of the inner thigh: pectineus, adductor longus, adductor brevis, adductor magnus, and gracilis.

If your symptoms are worrying you and you are not sure what to do, go ahead and make a doctor's appointment. Get started treating your trigger points; by the time the appointment rolls around, you may have solved the problem and can cancel.

Pectineus

The *pectineus* (pek-tin-EE-us) is the highest muscle of the inner thigh group, lying in a depression just below the inguinal crease (where the leg meets the body). Interestingly, the name *pectineus* derives from *pecten*, Latin for “comb.” The *pectineus* has the shape and size of the long-toothed combs that women wore in their hair in olden times. The muscle also has striations or ridges that resemble the teeth of a comb.

The *pectineus* attaches to the pelvis just to the outside of the pubic bone and to the back of the thighbone, near its top. These attachments enable the *pectineus* to move the thigh inward or forward, or to rotate it outward. This muscle uses these very actions to help you cross your legs.

Symptoms

Darren, age thirty-six, a massage therapist, had sharp pain in his right groin that typified pectineus trouble. The pain increased when he walked, especially if he took long strides. He knew muscles well, so he recognized the pain as coming from his right pectineus, which he'd strained running after a Frisbee the day before. Deep massage, self-applied, cured the problem in one day.

Pain from a *pectineus* trigger point occurs deep in the groin where the leg joins the body (figure 9.27). It may be felt as either a sharp pain or a deep ache, often seeming to be coming from the hip joint itself. When getting out of a chair, it may take you an extra minute to straighten up and walk upright. Pain from this trigger point can be misdiagnosed as degenerative joint disease or obturator nerve entrapment. Note that several other muscles may project pain to the groin, including the *psoas*, *iliacus*, *quadratus lumborum*, *gracilis*, and the three adductor muscles (Travell and Simons 1992; Muscolino 2009).

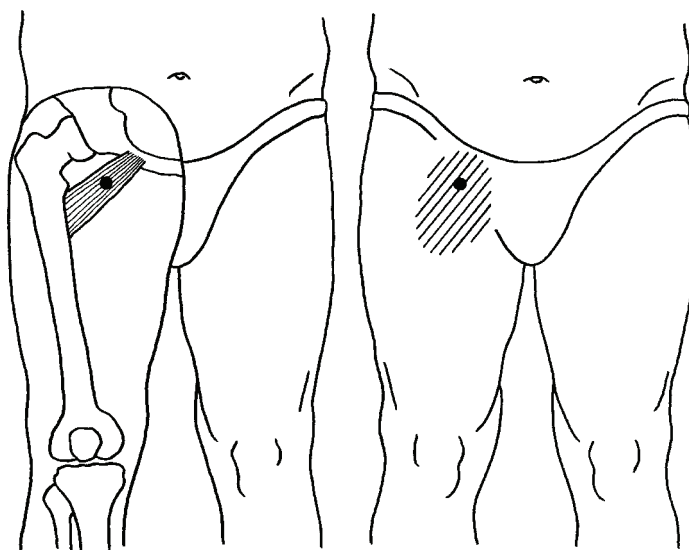


Figure 9.27 Pectineus trigger point and referred pain pattern (be cautious of the blood vessels, nerves, and lymph nodes here)

Causes

Unexpected slips and falls can cause the *pectineus* to be overcontracted or overstretched. Forced stretching or contracting of the *pectineus* in running games or gymnastics commonly creates trigger points. Doing the splits when you're out of condition is particularly unwise. The crossover soccer kick with the instep can overwork this muscle. Gripping the sides of the horse with your knees while riding is very tiring for the *pectineus* muscles.

Women can develop trigger points in their *pectineus* muscles and other muscles of their inner thighs from sexual activity. Too much sitting is bad for the *pectineus*, especially sitting with the legs crossed or held tightly together. Lifting with the legs far apart can strain the *pectineus* muscles. Hip replacement surgery can leave a *pectineus* muscle with trigger points and leave the patient with persistent “enigmatic” pain (Travell and Simons 1992).

See chapter 3, Treatment Guidelines for more information on the massage technique, how to stretch, and what to do if the technique is not working.

Treatment

Locate the pectineus muscle just under the inguinal crease, where the leg meets the body. Feel for the muscle in the bottom of the soft triangular depression just to the inside of the sartorius muscle (figure 9.28). This femoral triangle is bounded by the inguinal ligament (represented by the groin crease), the sartorius, and the adductor longus (see figures 9.6 and 9.31 for help in locating the sartorius and adductor longus). When contracted, these two muscles make a muscular V at the top of your thigh, a little to the inside. The trigger point is in the belly of the muscle on the leg just below the inguinal crease. It is a very specific bruise-like trigger point just to the inside of the femoral artery.

Massage the pectineus by pressing into the leg with the paired fingers of both hands while standing (figure 9.29). While sitting, you may be able to reach the muscle with the thumb of the opposite hand. The femoral nerve, artery, and vein pass through the groin in this area, so don't use a hard massage tool of any sort. Your fingers or thumb should do no harm if you're careful. If you feel the femoral artery pulsing under your fingers, just move to the inside a bit. This area will bruise easily, so plan to work conservatively on it over several days. Another way to massage this muscle is to lie down and bend the knee, placing the foot on the bed at the level of the opposite knee. Let the leg fall open to about a 45-degree angle. This will open the femoral triangle, allowing you to access the pectineus.

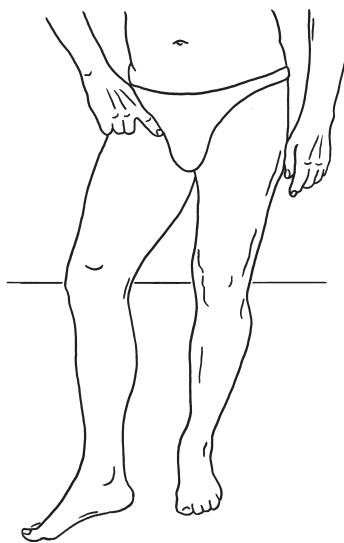


Figure 9.28 Locating pectineus by isolated contraction, raising the inner leg forward

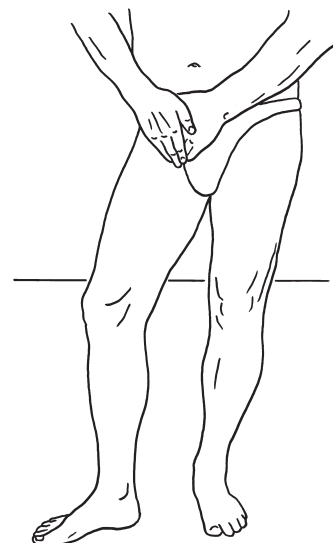


Figure 9.29 Pectineus massage with supported contraction, raising the inner fingers

Adductors Longus and Brevis

Both the *adductor longus* (uh-DUK-ter LONG-us) and the *adductor brevis* (uh-DUK-ter BREH-vis) attach to the pubic bone and to the back of the upper thighbone (femur). The adductor longus and pectineus muscles completely cover the adductor brevis. The adductor longus is a relatively long muscle, extending halfway down the inner thigh. Its lower part is covered by the vastus medialis. The adductor longus is the most prominent and easily located of the inner thigh muscles. Although the adductor longus and adductor brevis are separate muscles, they function essentially as one. For simplicity, we'll refer to them together as the "adductor longus."

Symptoms

Beverly, age fifty-two, had to stop her early morning walks at the mall because of the intense pain she had begun to have deep in her right hip. On an X-ray, the cartilage in her hip joint appeared to be thin. She was told that without an operation, her hip would only get worse and she'd probably end up in a wheelchair. She was assured that hip replacement was common now and that her insurance would pay for it.

As a last resort before scheduling surgery, and at the urging of a friend, Beverly went to a massage therapist. She was skeptical that anything so trivial as massage could help such a serious condition, but her friend pointed out that she had nothing to lose. Exquisitely tender places were found in Beverly's inner thighs. Pressure on the trigger points in her right leg sent pain to her hip that was just like the pain she got from walking. The therapist

showed her how to massage her own thighs and arranged for two follow-up sessions. In three weeks, the deep pain in her hip was gone and she was able to resume her walking at the mall.

Trigger points in the adductor longus are the most common cause of groin pain. Typically, it's felt deep in the hip joint (figure 9.30). Occasionally, pain may extend down the inner thigh to the inner side of the knee, as far as the shin (not shown). Pain occurs during vigorous activity and is greater when you're carrying something. Pain also may arise during any hard contraction of the inner thighs, such as might be caused by a sudden twist at the hip. At rest, there may be no pain at all (Travell and Simons 1992).

Adductor longus trigger points cause stiffness in the hip, tending to limit movement of the thigh in all directions and to restrict lateral rotation (turning your knee to the outside). The inner thigh feels drawn up and tight. Tightness and pain can curb your participation in sports or exercise. (Travell and Simons 1992).

Groin and inner thigh pain in children is often attributable to trigger points in the adductor muscles. They are among the muscles most likely to be abused in unrestrained play. These “growing pains” are usually left untreated and the child is left to suffer. This is regrettable because trigger points are as easily self-treated by children as they are by adults (Travell and Simons 1992).

Osteoarthritis in hip joints is a common problem in older adults and causes pain similar to that caused by trigger points. Arthritis pain is different, however, in that it is felt more in the outer hip than the inner thigh. Nevertheless, pain from adductor longus trigger points is often misinterpreted as arthritis. Massage of the adductor longus quickly differentiates the two conditions. If massage makes the pain go away, it's probably not being caused by arthritis. Even when arthritis is present, trigger points may contribute to the pain (Travell and Simons 1992).

Causes

Taking inordinately long steps or moving your legs too far apart can overstretch and strain the adductor longus muscles. Slipping on the ice is a classic way to cause a groin pull. Poor conditioning inevitably sets you up for muscle strain and myofascial trigger points. Horseback riding can overwork the adductor muscles.

Trigger points can activate very quickly in any muscle when you set out to play or work when you're cold and stiff. Even when you're warmed up and in good condition, be circumspect about quick, impetuous starts before the muscles have done a little easy work.

Treatment

You can easily locate an adductor longus muscle while lying on your side with your leg bent and lying on its side (figure 9.31). In the illustration, the ghosted hand is point-

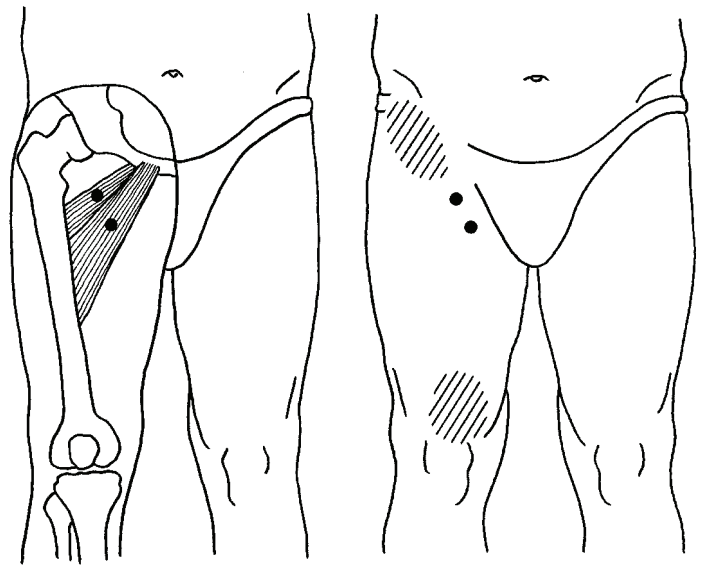


Figure 9.30 Adductors longus and brevis trigger points and referred pain pattern

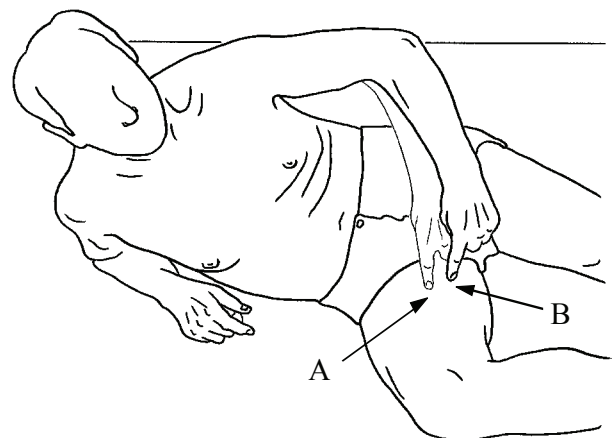


Figure 9.31 Locating adductor longus (A) and adductor magnus (B) by isolated contraction, raising right leg from bed

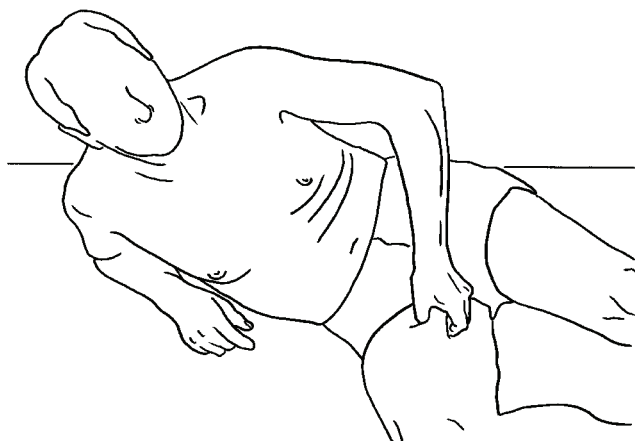


Figure 9.32 Grasping adductor longus between fingers and thumb

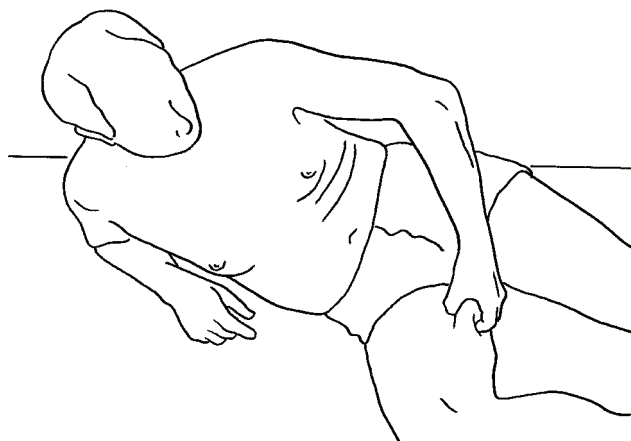


Figure 9.33 Grasping adductor magnus between fingers and thumb

ing to the adductor longus. The fully rendered hand points to the adductor magnus, which will be discussed in the next section.

Raise your knee slightly off the bed to feel the adductor longus muscle contract. It should stand out clearly as it approaches the groin, and you may be able to grasp it between your fingers and thumb (figure 9.32). Compare this with how you grasp the adductor magnus, which is immediately behind the adductor longus (figure 9.33). This isolated contraction test can also be done sitting in a chair.

Massage the adductor longus with supported fingers with your leg

lying on its side on the bed (figure 9.34). The muscle should be relaxed in this position. If you can, also massage the inner thigh muscles while sitting in a chair using your hands, shaft of the Thera Cane, or any stick-like tool such as the Tiger Tail.



Figure 9.34 Adductor massage with supported fingers or supported knuckles

Trigger points can be perpetuated by many dietary choices. “Trigger Point Perpetuators” in chapter 2 offers more information.

Adductor Magnus

The adductor magnus (uh-DUK-ter MAG-nus) is the third largest muscle in the body. It attaches right in the crotch between the pubic bone and the sit bone and then divides into three parts, which descend to attach all along the back of the femur. The longest segment attaches just above the knee.

The muscle fibers of the different sections of the adductor magnus travel at different angles, giving the muscle the ability to participate in several functions. The main job of the adductor magnus muscles is to strongly adduct the thighs, that is, to bring the legs together. They also help stabilize the pelvis and extend the thighs during walking and running.

The adductor magnus is a complex muscle. It is well worth learning about, however, because its trigger points can cause the kind of worry and grief experienced by Carol.

Carol, age twenty-three, a graduate music student majoring in piano, had gone to a massage therapist for help with pain in her hands. During the third session, she hesitantly asked if massage might help her “sexual pain,” too. Encouraged to explain, she said that she had been sexually active for five years and had always experienced extreme pain in her vagina. Having her legs apart made it worse. With further questioning, she remembered that

even when she was a child, her inner thighs had always seemed tight and would never stretch well after exercise. She said that she sometimes felt a pulling that verged on pain if she stepped out too far when walking or running.

At the university clinic, they told her she was perfectly fine physically. It was suggested that she get some counseling, and perhaps drink a glass of wine before she got together with her boyfriend. Carol had tried both “prescriptions,” but neither had helped.

Massage of Carol’s inner thighs revealed very tender trigger points high on both inner thighs, just in front of the gluteal folds. She felt embarrassed to have massage done in that area and asked if it would be possible to do the massage herself. After some experimentation, she was able to massage the tender spots with a tennis ball while sitting on a hard wooden chair. She later reported a satisfactory outcome.

Symptoms

Trigger points in the upper part of the adductor magnus cause pain inside the pelvis (figure 9.35). This deep internal pain may be quite diffuse and unfocused, or it may be localized as a sharp, sudden explosion of pain at the pubic bone or in the vagina, rectum, prostate, or bladder. Trigger points in the middle part of the muscle cause pain and stiffness in the inner thigh, from the groin almost to the knee (figure 9.36) (Travell and Simons 1992).

Pain from trigger points in the adductor magnus is increased by extreme abduction, moving the leg outward to the side (spreading apart the thighs) and hip flexion (bending at the hip). For this reason, internal pelvic pain may occur in women during intercourse, causing great worry about possible visceral or gynecological disease. The obturator internus (see chapter 7, “Pelvic Floor Muscles”) is also activated by overstretching in this position. Unawareness of the myofascial causes of internal pelvic pain can lead to a wide range of mistaken diagnoses and misdirected treatment, including surgery. Examination for myofascial trigger points should always be done when diagnosing pain in the area of the pelvis. Many concerns can be eliminated if simple massage takes away the pain (Travell and Simons 1992).

Causes

The adductor magnus muscles are employed in such activities as climbing stairs, gripping the sides of a horse while riding, and making quick turns in skiing. Trigger points are likely to arise when these activities are overdone. During exercise, take care not to overstretch muscles that are already inhibited by trigger points.

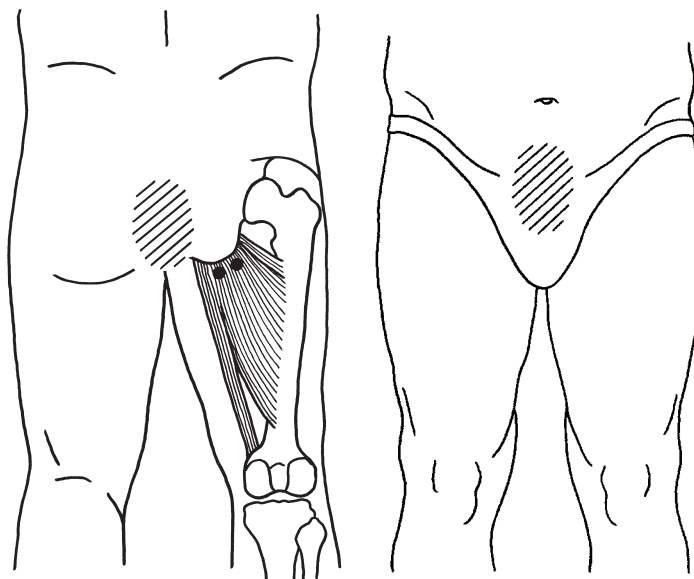


Figure 9.35 Adductor magnus number 1 trigger points and referred pain pattern

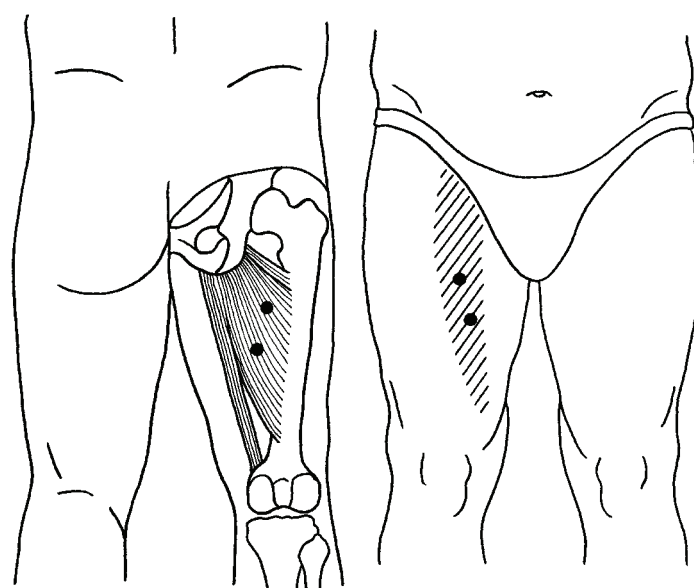


Figure 9.36 Adductor magnus number 2 trigger points and referred pain pattern. These points can be worked by either pinching the inner thigh or pressing the muscle medially against the bone.

Other common causes of adductor magnus difficulties are accidental slips of the feet while coming down stairs, slipping while walking on ice, or simply getting in and out of a car. A sudden overload with the legs apart or any movement that suddenly spreads the legs can strain the adductor magnus muscles.

Treatment

The adductor magnus is behind the adductor longus and brevis muscles. Look again at figures 9.31, 9.32, and 9.33. Try to differentiate among these muscles by putting your fingers between them on the inner thigh.

A tennis ball, lacrosse ball, or 45 mm high bounce ball can be used to massage the uppermost trigger point while sitting on a hard chair or bench. This is difficult to illustrate clearly, so the approximate position of the ball is shown on the vertical body (figure 9.37). It's also possible to work this place with your fingers while lying down on your back with the knee and hip bent. The pain from massaging this trigger point can be quite surprising and intense, so go easy: it's an important trigger point to resolve.

Massage the adductor magnus number 2 trigger points with supported fingers. Prop the leg up on the bed as shown in figure 9.34 in the section on the adductor longus. Massage can also be done seated by grasping all of this muscle between your thumb and fingers. The trigger points will be right in the middle of your pinch neither on the front of the thigh nor on the back of it. Massage can also be done with the shaft of the Thera Cane or a stick-like tool like the Tiger Tail.

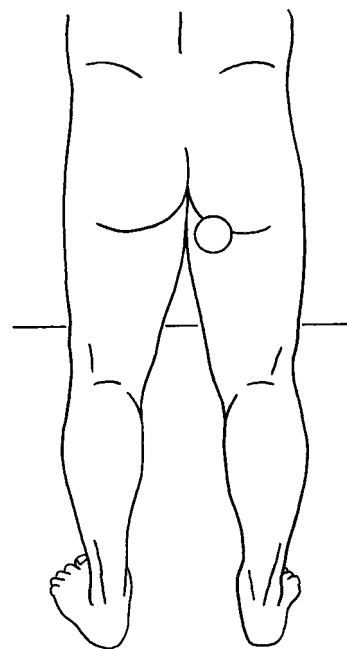


Figure 9.37 Position of ball for adductor magnus number 1 trigger point massage on hard chair

Gracilis

The thin, flat *gracilis* (GRAS-il-iss) muscle is the second longest muscle in the body; only the sartorius is longer. *Gracilis* is a Latin word meaning “slender.” The gracilis muscle attaches to the pubic bone and then descends the full length of the inner thigh to attach again below the knee. These attachments give the gracilis an action at the hip and at the knee, helping flex both joints. Because the muscle is normally slack, it's not easily overloaded. Trigger points in the gracilis are usually induced by referred pain from trigger points in the other inner thigh muscles.

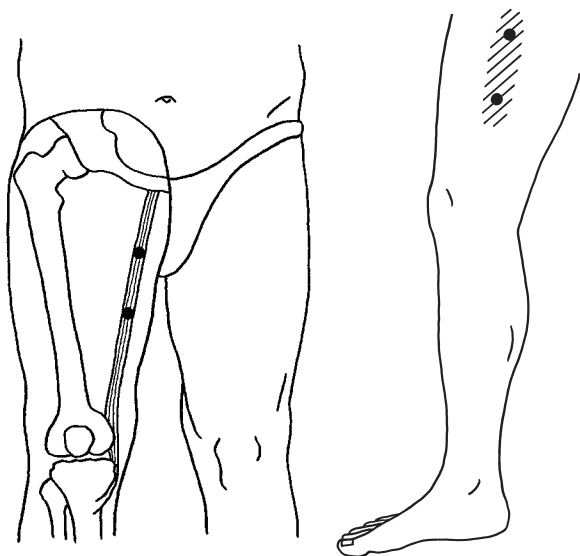


Figure 9.38 Gracilis trigger points and referred pain pattern

Pain from gracilis trigger points is local to the muscle and is not referred to any other site (figure 9.38). Although only two trigger points are shown in the drawing, they may be found anywhere along the length of the muscle. The pain is usually a hot, stinging sensation, felt right under the skin along the inside of the thigh. There may also be a sense of diffuse achiness in the same area. Pain is constant at rest and is not relieved by any change of position; however, walking sometimes gives relief (Travell and Simons 1992).

The gracilis and sartorius muscles produce pain in similar locations on the inner thigh. Stretching isn't effective for either the sartorius or the gracilis.

The gracilis muscle is the most superficial of the inner thigh muscles, lying immediately under the skin. Nevertheless, you may not be able to distinguish the gracilis from the general mass of adductor muscles unless you happen to be very thin. Its trigger points can be located, however, by simply searching for relatively

superficial tender spots along the inner thigh. Massage the gracilis with supported fingers or by pinching a shallow grasp of tissue.

Hamstring Muscles

You may not have a clear idea of just what your *hamstrings* are, or exactly where they are. They're not “strings” at all, but rather three exceptionally strong, slender muscles that cover the backs of the thighs (figure 9.39). Latent trigger points in the hamstrings, with consequent tightening of these muscles, are extremely common. Pain and stiffness from hamstring trigger points occur as often in children as they do in adults (Travell and Simons 1992).

You've heard of athletes having “pulled a hamstring” or, worse, having torn a hamstring. Such injuries can originate with trigger points that prevent normal lengthening of the hamstrings. Muscles in this state don't respond completely to warm-ups or stretching routines and are very susceptible to strain and physical damage. If athletes were more aware of trigger points and knew how to deactivate them, there would undoubtedly be fewer hamstring injuries. The following case history illustrates the long-term effects a hamstring injury can have when treatment doesn't include care for incidental trigger points (Travell and Simons 1992).

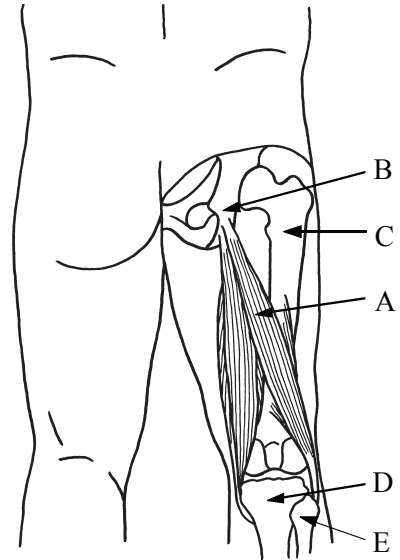


Figure 9.39 (A) hamstrings, (B) sit bone, (C) femur, (D) tibia, (E) fibula

Nathan, age twenty-one, experienced a serious low back strain on his job with a package delivery company. The pain sent him to the emergency room, where he was given painkillers and muscle relaxants. The pain persisted, however, and he was unable to resume work.

Several sessions of massage to his back and buttocks muscles got rid of Nathan's back pain, but he still had difficulty bending over to pick anything up because of stiffness in the backs of his legs. He revealed that he'd had that stiffness ever since tearing a hamstring running the hurdles in high school. The injury had ended all participation in athletics. He often had pain in the back of the leg that had been injured and hadn't been able to touch his toes in five years. Stiff hamstring muscles, in making it hard for him to bend over, had made back strain inevitable.

Self-applied massage with a tennis ball in a sock on a wooden chair allowed the muscles to begin to lengthen. Nathan was able to return to work with renewed confidence. Despite the scarring that remained in the one hamstring muscle from the old injury, he was eventually able to touch his toes again.

Biceps Femoris

The *biceps femoris* (FEM-or-iss) has two parts and is comparable to the biceps muscle of the upper arm. It is also known as the “lateral hamstring,” or the one closer to the outer side of the thigh.

The main part of the biceps femoris attaches to the sit bone and to the back of the thighbone. It then descends to attach to the top of the fibula, the slender outer bone of the lower leg. The biceps femoris has great power to bend the knee, and it also participates in extending the hip. These actions are necessary for walking, running, and jumping. The braking action of all the hamstrings keeps the body from falling forward whether you are moving or standing still. The hamstrings also control the rate of descent when you bend forward at the hip.

Symptoms

Pain from trigger points in the biceps femoris muscle is felt as a dull aching behind the knee (figure 9.40). The pain tends to be toward the outer side of the back of the thigh rather than centered, and sometimes is concentrated around the head of the fibula. Discomfort from biceps femoris trigger points sometimes extends up the back of the thigh and down into the upper calf (not shown) (Travell and Simons 1992).

Causes

Trouble with the hamstrings comes about when the legs are kept bent at the hip and knee joints for long periods. A sedentary lifestyle is bad for the hamstrings, tending to shorten and stiffen them. Chairs that put deep pressure on the backs of the thighs promote the development of hamstring trigger points. Playing football, basketball, and soccer frequently results in hamstring injuries, particularly when the players are poorly conditioned. Other sports activities like swimming and cycling can be hard on the hamstrings when latent trigger points keep them shortened and weak (Travell and Simons 1992).

The actions of all the thigh and hip muscles are interrelated. Trouble in one muscle causes problems in the others. Tightness in the quadriceps muscles, for example, makes the hamstrings overstretched and likely to develop trigger points in reaction to having to work harder. Trigger points in the hamstrings cause the pelvis to tilt backward (or posteriorly, like tucking the tail under), causing the gluteal muscles to be under strain, since both these muscle groups must lengthen to allow you to bend at the hip. The weakening effect of hamstring trigger points also places a greater burden on the sartorius, gracilis, gastrocnemius, and plantaris muscles during knee flexion. You should always expect to find multiple trigger points in the hips and thighs.

Treatment

Differentiate the biceps femoris from the other hamstring muscles by feeling for the groove between them halfway up the back of the thigh. You can do this while sitting. Keep your foot on the floor and contract the back of the thigh as if you were trying to pull your foot back. This will make the muscles stand out. Also, feel at the outer side of the back of the knee for the heavy biceps femoris tendon. This tendon ends at the head of the fibula, the knob at the top of the outer side of the lower leg. Note in figure 9.40 that the muscle travels diagonally up the back of the leg from the head of the fibula to the sit bone. The lower black dot in each leg represents possible multiple trigger points in the short head of the biceps femoris, which is hidden by the long head.

The hands and fingers tire quickly when used to massage hamstring trigger points, but the Thera Cane or a stick tool (figure 9.41) like the Tiger Tail work well when you're either standing or sitting. Try levering the Thera Cane against the hamstrings while sitting in a soft chair. Better yet, work them with a tennis ball, large high bounce ball, or lacrosse ball while sitting on a hard surface, such as a wooden chair or bench (figure 9.42). To avoid the lymph nodes, blood vessels, and nerves, do not roll the ball behind the knee.

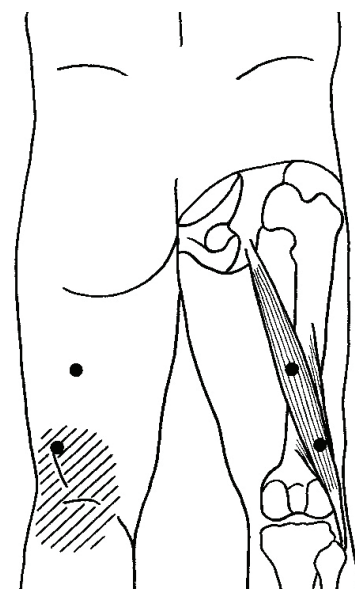


Figure 9.40 Biceps femoris trigger points and referred pain pattern



Figure 9.41 Hamstring massage with a dowel rod or broomstick

Treat the back of the knee carefully, as instructed in the “Muscles behind the Knee” section later in the chapter.

To take better care of your hamstrings, note the types of chairs, couches, and car seats that put pressure on the backs of your thighs, and make adjustments wherever possible. If your feet don’t rest squarely on the floor, use anything you can find as a footrest. The hamstrings of people with short legs are put at risk everywhere they go; car seats and deep couches cause problems even for tall people.

Latent trigger points in hamstring muscles are unusually sneaky: you may never suspect you have them even when they cause serious trouble. It pays to check often on the condition of the hamstrings and take the time to work on the trigger points you find. It’s the best preventative measure possible for warding off serious hamstring injuries and the effects that shortened hamstrings can have on other muscles.

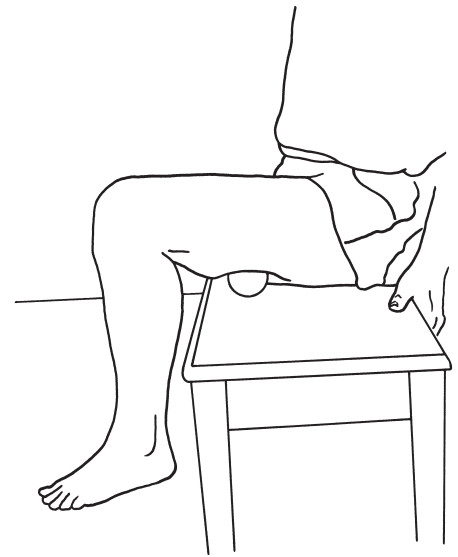


Figure 9.42 Hamstring massage with ball on wooden bench or chair. Avoid rolling the ball in the soft, fleshy area behind the knee.

Semitendinosus and Semimembranosus

The “semi” muscles, *semitendinosus* (seh-me-ten-din-OH-sis) and *semimembranosus* (seh-me-mem-bran-OH-sis), are the other half of the hamstrings, complementing and counterbalancing the force of the biceps femoris. Their names reflect the fact that half the length of both muscles is made up of very strong tendon-like tissue. These muscles act as a unit and will be discussed as though they were one muscle; we’ll call them the “semi muscles” for short.

Symptoms

Pain from trigger points in the semi muscles is felt primarily high on the back of the thigh at the gluteal fold (figure 9.43). The pain pattern sometimes extends down the inner side of the back of the thigh and into the calf (not shown). In this case, the entire back of the thigh, from the gluteal fold to the calf, may be tender to the touch. When pain from the semi muscles does occur at the knee, it is a sharper sensation than pain from the biceps femoris and is felt more toward the inner side of the knee (Travell and Simons 1992).

Pain and stiffness caused by trigger points in the semi muscles is frequently mislabeled “hamstring tendinitis.” The wide distribution of pain from hamstring trigger points may also lead to a mistaken diagnosis of sciatica. Noninvasive treatments such as an exploration for trigger points should be tried before more invasive options (Travell and Simons 1992).

Causes

The semi muscles attach to the sit bone and to the inner side of the top of the tibia. Their action is to help extend the hip and flex the knee. Injuries to the semi muscles occur at maximum flexion of the hip and extension of the knee, the position at which the two muscles are at their maximum length. This is the position the

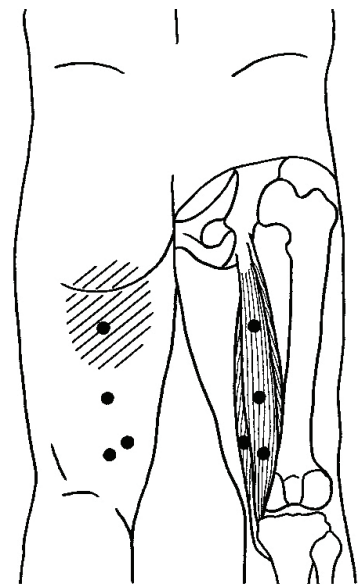


Figure 9.43 Semitendinosus and semimembranosus trigger points and referred pain pattern

leg is in just after kicking a soccer ball or football. When you're running the hurdles or doing the splits in gymnastics, it's the forward leg that is at risk for hamstring injury.

Overstretching causes trigger points in the semi muscles, as does too little stretching resulting from too little activity. Sitting all day and all evening—on the job, in the car, and at home—contributes to shortening of the semi muscles (Travell and Simons 1992).

Tightness in any of the hamstring muscles is frequently the root of chronic low back pain. Tight hamstrings cause a posterior tilt of the pelvis (tucking the tail under), flattening the curve of the lower back and distorting the mechanics of back and buttocks muscles. The resulting posture also encourages the head to be projected forward, resulting in added strain on the upper back and neck. In these ways, the domino effect of tight hamstrings can be the indirect cause of pain in quite distant parts of the body, including the jaw, face, and head. In short, your hamstrings can be involved even if your only complaint is chronic headaches (Travell and Simons 1992).

Treatment

Locate the semi muscles on the inner side of the back of the thigh. Search the entire area with a tennis ball, 60 mm high bounce ball, or lacrosse ball against the seat of a wooden chair, as with the biceps femoris (figure 9.42). Move your leg from side to side over the ball, exploring the full width of the back of the thigh. To avoid the lymph nodes, blood vessels, and nerves, do not roll the ball behind the knee. Treat the back of the knee carefully, as instructed in the “Muscles behind the Knee” section below. Make sure to rotate the knee and thigh to the inside to get the ball on the medial side of the back of your thigh. Most trigger points in the semi muscles will be found in the mid- and lower thigh, although it's not unusual for them to occur right below the sit bone. In figure 9.43, each black dot in the lower half of the two muscles represents possible multiple trigger points in the semimembranosus, which is hidden by the semitendinosus. You may not suspect you have trigger points in your hamstrings until you take the trouble to look for them.

The most important thing to remember about all the hamstring muscles is that they can't be adequately stretched unless their trigger points are deactivated first: trigger points actively inhibit the lengthening of muscle fibers. The stretching that is done before exercise and sports activities may give you the feeling that you're taking proper care of your hamstring muscles, but if their trigger points are left untreated, they can still be at risk for injury.

Muscles behind the Knee

There are two very important muscles behind the knee. Generally, this area is considered an “endangerment” zone, which means that there are many delicate structures such as nerves, blood vessels, and lymph nodes that are not well padded or protected. That being said, it is possible to palpate and treat the muscles specifically by following the treatment descriptions below.

Popliteus

The *popliteus* (pop-lih-TEE-us) is a small muscle found at the back of the knee. The word “popliteus” derives from *poples*, Latin for “ham.” The popliteus, being small and hidden, is often overlooked in troubleshooting for trigger points.

The popliteus muscle's upper attachment is to the outer side of the lower end of the thighbone. Its lower attachment is to the top of the back of the tibia. Its function is to unlock the knee so that it can bend. The popliteus also assists the posterior cruciate ligament (inside the knee joint) in preventing the femur from moving forward on the tibia. Damage to this ligament may overload the popliteus, causing pain from trigger points to persist after surgical repairs to the ligament have been made.

Symptoms

Trigger points in the popliteus muscle cause pain behind the knee when you straighten your leg (figure 9.44). A shortened popliteus will prevent normal locking of the knee. The popliteus may not be suspected until trigger points in the biceps femoris have been deactivated.

Pain is also felt when crouching, running, or walking, and is worse when walking downhill or downstairs. Trigger points in popliteus muscles are often responsible for the acute pain experienced in the backs of the knees by hikers and backpackers on their way back down from a climb.

Knee pain caused by popliteus trigger points can be mistaken for Baker's cysts, tendinitis, torn ligaments, and damage to the meniscus or other knee joint tissues. While real physical damage to the knee is always a possibility, especially from accidents and in violent team sports, you shouldn't assume that knee pain automatically means knee surgery. The first step should be to look for trigger points in the muscles that control the knee (Travell and Simons 1992).

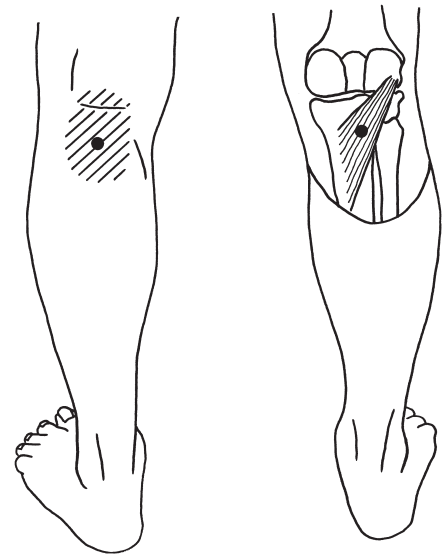


Figure 9.44 Popliteus trigger point and referred pain pattern

Causes

Popliteus muscles are overworked by running, twisting, sliding, and quickly changing direction in running games such as soccer, baseball, and football. Tennis, volleyball, and track competition are other events where popliteus stress may occur. Downhill skiing and downhill hiking are hard on popliteus muscles. Wearing a knee brace for pain relief can be an unsuspected cause of popliteus trouble by immobilizing the muscle and preventing its normal action (Travell and Simons 1992).

Treatment

It is important to avoid the nerves and blood vessels behind the knee and to be cautious of the lymph nodes. Read more about precautions in the section “Contraindications: Reasons to be Cautious” in chapter 3. To confirm that you are touching the popliteus, identify it with isolated contraction. While seated, repeatedly turn the foot inward as if you are trying to touch the tips of your toes together. From the inside of the lower leg about 2 inches below the knee, feel for the popliteus to contract behind the gastrocnemius. You can massage this muscle here or through the gastrocnemius using the techniques shown in figures 9.45 or 9.46. Only use your hands here—never a hard tool.



Figure 9.45 Popliteus massage with fingers of both hands (be sure to palpate the muscle carefully, as described in the text, to avoid the delicate blood vessels and nerves)



Figure 9.46 Popliteus massage with thumbs (be sure to palpate the muscle carefully, as described in the text, to avoid the delicate blood vessels and nerves)

Avoid stretching the popliteus and other muscles of the back of the leg without first massaging trigger points that may inhibit lengthening. Avoid wearing high heels if you can; they tend to keep the knees flexed and the popliteus muscles shortened. A sedentary lifestyle is perfect preparation for myofascial disasters. Be cautious about suddenly going hog-wild about getting into shape, but do find ways to be active in a regular and reasonable fashion.

A sedentary lifestyle is perfect preparation for myofascial disasters.

Plantaris

The *plantaris* (plan-TEHR-iss) is also a small muscle found behind the knee. Its name reflects a very different function from that of the popliteus. Plantaris comes from the Latin *planta*, meaning “sole of the foot.” (You may be familiar with plantar warts, which occur on the bottom of the foot.) With the aid of its incredibly long tendon, the plantaris helps the calf muscles *plantar flex* the ankle; plantar flexion is when you point the foot down.

The plantaris attaches to the bottom end of the thighbone near the attachment for the popliteus. Its long tendon descends to attach to the calcaneus, or heel bone, joining the Achilles tendon. A very small muscle, the

plantaris is easily overstretched when extreme extension occurs in the knee and ankle at the same time. The knee is straight in extreme extension; the foot is bent upward from the ankle as far as it will go. If you have ever, for fun, walked on the backs of both of your heels at the same time you’ve been in the position that stretches the plantaris. The foot slipping backward down off of a step or curb while trying to climb it is an example of how this muscle could be injured.

Pain from plantaris trigger points is centered behind the knee but may extend down into the upper calf (figure 9.47). It is important to avoid the nerves and blood vessels behind the knee and to be cautious of the lymph nodes. Read more about precautions in the section “Contraindications: Reasons to be Cautious” in chapter 3. Make sure the knee is bent to a 90-degree angle while seated. Search for trigger points at the outer side of the back of the knee. Massage gently with fingertips just below the crease. Use the same massage techniques as for the popliteus (figures 9.45 and 9.46).

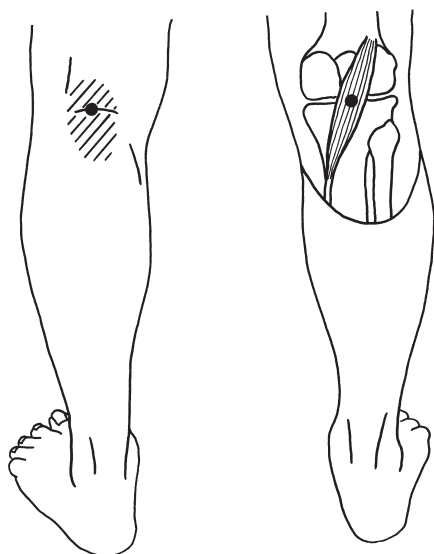
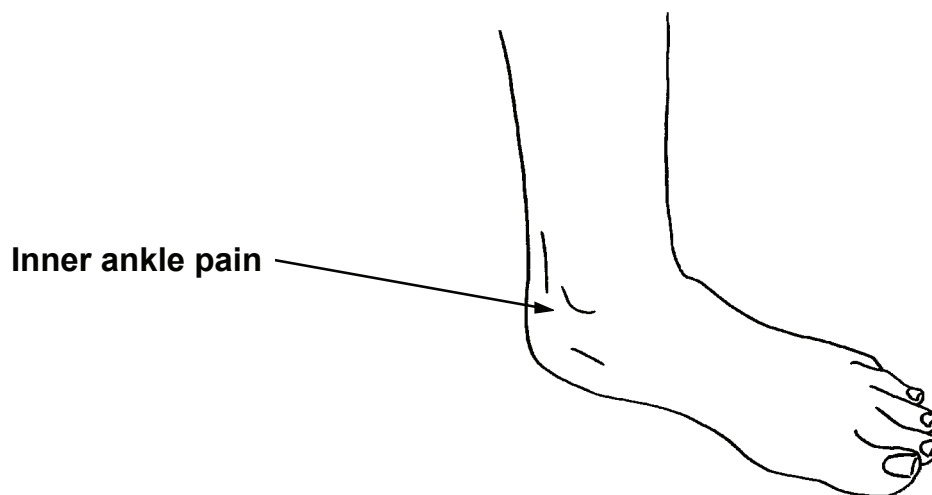
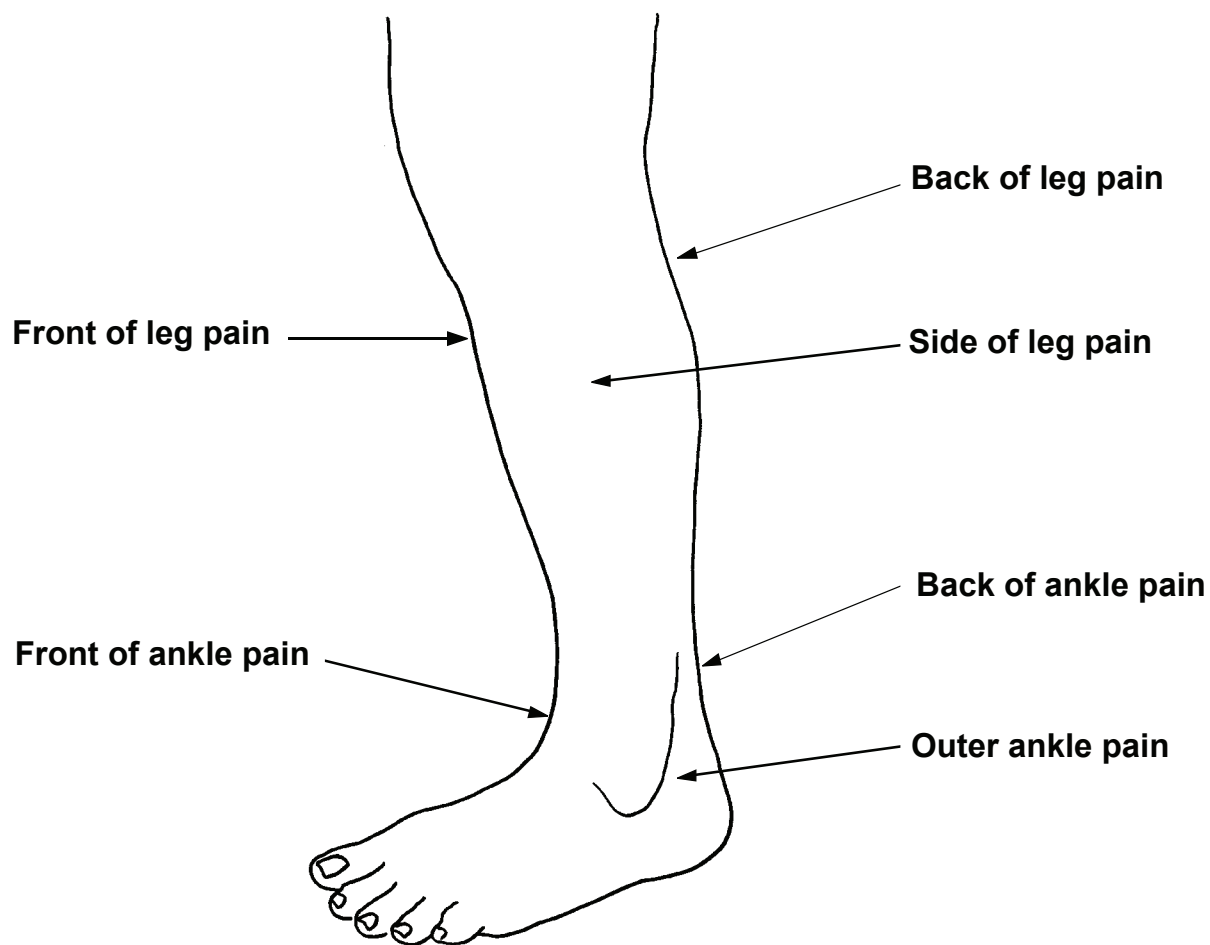


Figure 9.47 Plantaris trigger point and referred pain pattern

Chapter 10

Lower Leg, Ankle, and Foot Pain

Lower Leg and Ankle



Pain Guide

Lower Leg and Ankle

Boldface type indicates a primary pain pattern. Regular type refers to a less common or satellite trigger point pattern. Muscles are listed in the order of how likely they are to be the problem. *Also see Other Symptoms Guide.* We've made these guides available for download at www.newharbinger.com/24946. See the back of the book for more information.

Back of Ankle

soleus (270)
tibialis posterior (273)
 flexor digitorum longus (274)

Back of Leg

soleus (270)
gluteus minimus (207)
gastrocnemius (267)
 semitendinosus (241)
 semimembranosus (241)
 flexor digitorum longus (274)
 tibialis posterior (273)
 plantaris (244)

Front of Ankle

tibialis anterior (256)
peroneus tertius (266)
extensor digitorum longus (259)
 extensor hallucis longus (259)

Front of Leg

tibialis anterior (256)
 adductor longus (234)

Inner Ankle

abductor hallucis (282)
flexor digitorum longus (274)
 soleus (270)

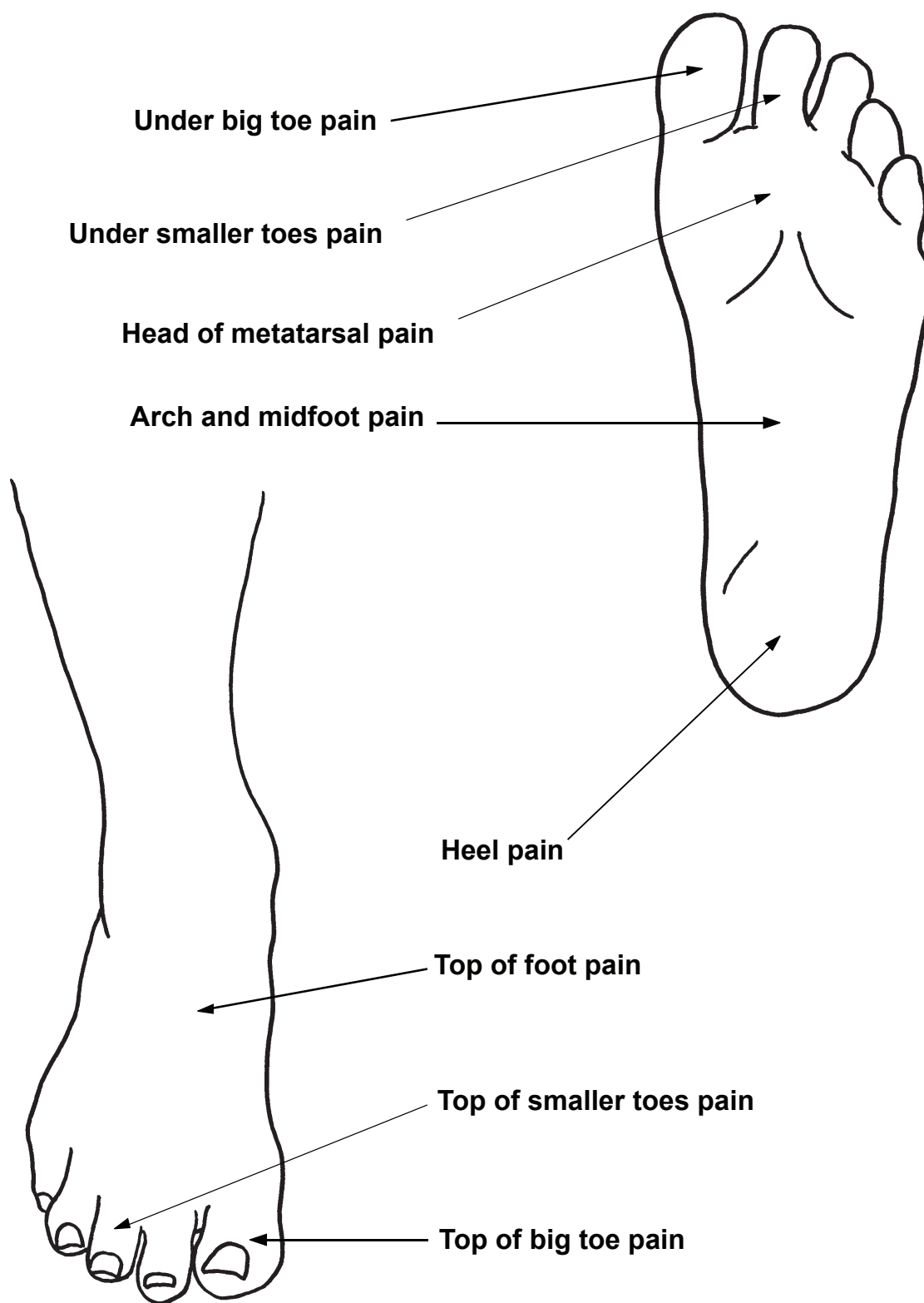
Outer Ankle

peroneus longus (262)
 peroneus brevis (265)
abductor digiti minimi (283)
 peroneus tertius (266)

Side of Leg

gastrocnemius (267)
 gluteus minimus (207)
 peroneus longus (262)
 peroneus brevis (265)
 vastus lateralis (229)

Foot Pain



Pain Guide

Foot

Boldface type indicates a primary pain pattern. Regular type refers to a less common or satellite trigger point pattern. Muscles are listed in the order of how likely they are to be the problem. *Also see Other Symptoms Guide.* We've made these guides available for download at www.newharbinger.com/24946. See the back of the book for more information.

Arch and Midfoot

gastrocnemius (267)
flexor digitorum longus (274)
adductor hallucis (285)
 soleus (270)
 abductor hallucis (282)
tibialis posterior (273)

Head of Metatarsal

flexor hallucis brevis (285)
flexor digitorum brevis (279)
adductor hallucis (285)
flexor hallucis longus (259)
interosseous (279)
 abductor digiti minimi (283)
 flexor digitorum longus (274)
 tibialis posterior (273)
 flexor digiti minimi brevis (286)

Heel

soleus (270)
quadratus plantae (284)
abductor hallucis (282)
tibialis posterior (273)
 abductor digiti minimi (283)
 gastrocnemius (267)

Top of Big Toe

tibialis anterior
 extensor hallucis longus (259)
 flexor hallucis brevis (279)

Top of Foot

extensor digitorum brevis (279)
extensor hallucis brevis (279)
extensor digitorum longus (259)
extensor hallucis longus (259)
flexor hallucis brevis (285)
interosseous (279)
 tibialis anterior (256)

Top of Smaller Toes

interosseous (279)
extensor digitorum longus (259)

Under Big Toe

flexor hallucis longus (259)
 flexor hallucis brevis (285)
 tibialis posterior (273)

Under Smaller Toes

flexor digitorum longus (274)
 tibialis posterior (273)

Other Symptoms Guide

Lower Leg, Ankle, and Foot

Achilles Tendonitis

tibialis posterior (273)
soleus (270)
gastrocnemius (267)

Ankle Sprain

peroneus longus (262)
peroneus brevis (265)
peroneus tertius (266)

Claw Toes

flexor digitorum longus (274)

Calf Cramps

gastrocnemius (267)
extensor digitorum longus (259)

Hammertoes

flexor digitorum longus (274)
extensor digitorum longus (259)

Morton's Foot Syndrome

peroneus longus (262)
peroneus brevis (265)
peroneus tertius (266)
tibialis posterior (273)
flexor digitorum longus (274)
flexor hallucis longus (259)

Numbness and Tingling

Lower Leg and Foot

piriformis (182)

Big Toe

first interosseous (279)

Toes

flexor digiti minimi brevis (286)
flexor hallucis brevis (285)
adductor hallucis (285)
interosseous (279)

Top of the Foot

peroneus longus (262)

Plantar Fasciitis

soleus (270)
gastrocnemius (267)
quadratus plantae (284)
flexor digitorum brevis (279)
abductor hallucis (282)
abductor digiti minimi (283)

Pain or Trouble with Movement

Aching Pain at Rest

abductor hallucis (282)
abductor digiti minimi (283)
flexor digitorum brevis (279)

Ankle

tibialis anterior (256)

Back of Knee Pain while

Climbing Up Stairs or Hills

gastrocnemius (267)
soleus (270)

Difficulty Picking Things Up off of the Floor

soleus (270)

Dorsiflexion (flexing foot)

soleus (270)
tibialis anterior (256)

Foot Drop

tibialis anterior (256)
peroneus longus (262)
extensor digitorum longus (259)

Foot Slap

tibialis anterior (256)
extensor digitorum longus (259)

Pain and Swelling of Ankle and Foot

soleus (270)

Running

soleus (270)
tibialis posterior (273)

Standing

flexor digitorum longus (274)
flexor digitorum brevis (279)
flexor hallucis longus (259)

Standing: Leaning Forward

gastrocnemius (267)

Straightening the Knee with Foot Flexed

gastrocnemius (267)

Tripping

tibialis anterior (256)

Unstable Ankle (also see Morton's Foot)

peroneus longus (262)
peroneus brevis (265)
peroneus tertius (266)

Walking

- tibialis anterior (256)
- tibialis posterior (273)
- gastrocnemius (267)
- soleus (270)
- flexor digitorum longus (274)
- flexor hallucis longus (259)
- flexor digitorum brevis (279)
- flexor hallucis brevis (285)

Walking Down Stairs or Hills

- soleus (270)

Walking Fast

- soleus (270)
- gastrocnemius (267)

Walking on Slanted Surface

- gastrocnemius (267)

Shin Splint

- tibialis anterior (256)

Tenderness

Achilles Tendon

- soleus (270)

Ankle

- tibialis anterior (256)
- peroneus tertius (266)

Big Toe

- tibialis anterior (256)

Bottom of Forefoot

- adductor hallucis (285)
- flexor digitorum longus (274)
- flexor digitorum brevis (279)

Heel

- soleus (270)
- quadratus plantae (284)

Sides of the Toes

- interosseous (279)

Top of Feet

- extensor digitorum longus (259)
- extensor hallucis longus (259)

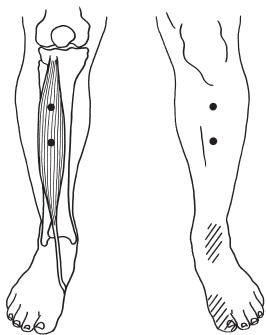
Weakness

Ankle

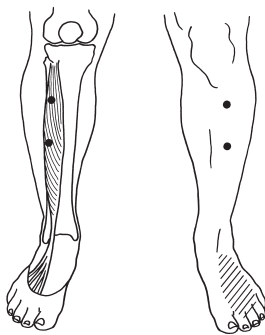
- tibialis anterior (256)
- extensor digitorum longus (259)
- peroneus longus (262)
- peroneus brevis (265)
- peroneus tertius (266)

Pain Illustrations Guide

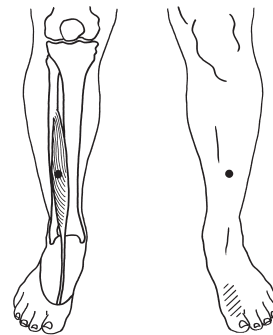
Lower Leg, Ankle, and Foot



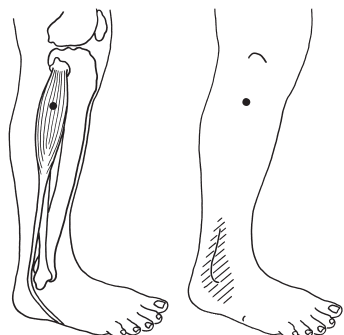
Tibialis anterior trigger points and referred pain pattern (p. 257)



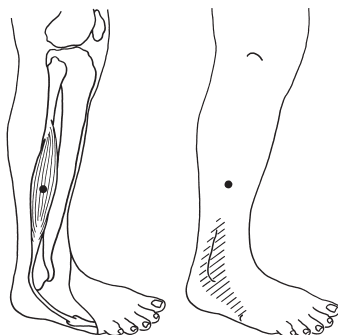
Extensor digitorum longus trigger point and referred pain pattern (p. 260)



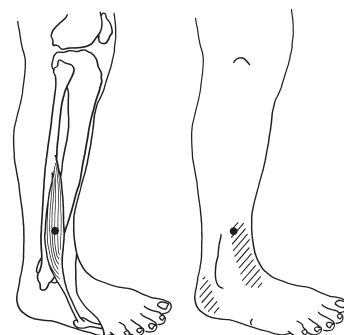
Extensor hallucis longus trigger point and referred pain pattern (p. 260)



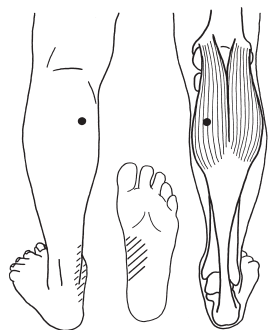
Peroneus longus trigger point and referred pain pattern (p. 263)



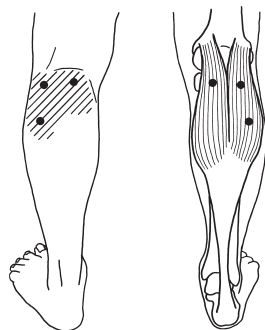
Peroneus brevis trigger point and referred pain pattern (p. 265)



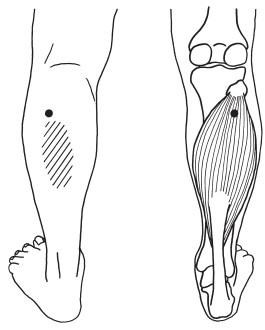
Peroneus tertius trigger point and referred pain pattern (p. 266)



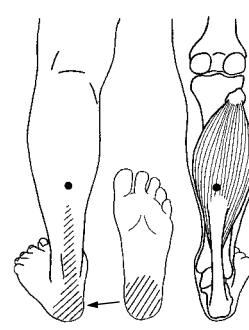
Gastrocnemius number 1 trigger point and referred pain pattern (p. 268)



Other gastrocnemius trigger points and local pain pattern (p. 268)

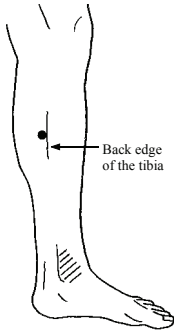


Soleus number 1 trigger point and referred pain pattern (p. 271)

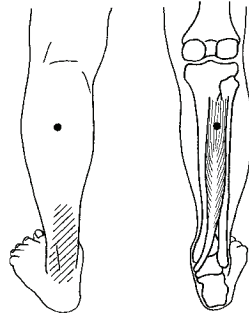


Soleus number 2 trigger point and referred pain pattern (p. 271)

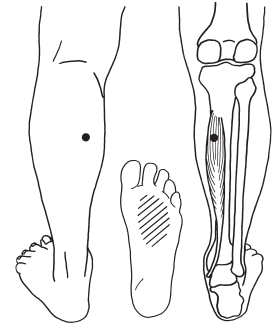
We've made this guide available for download at www.newharbinger.com/24946. See back of book for more details.
Caution: Please read the full treatment instructions for each muscle before beginning.



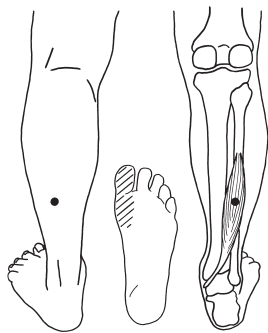
Soleus number 4 trigger point and referred pain pattern (p. 271)



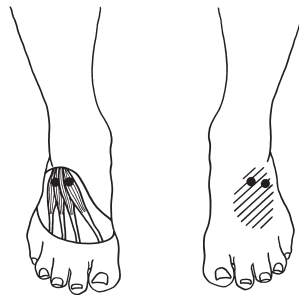
Tibialis posterior trigger point and referred pain pattern (p. 273)



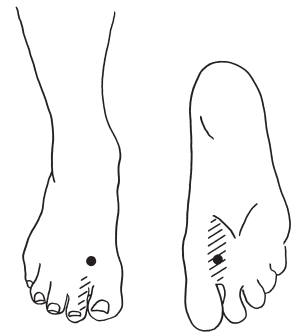
Flexor digitorum longus trigger point and referred pain pattern (p. 274)



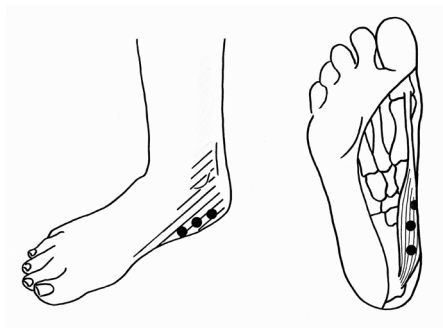
Flexor hallucis longus trigger point and referred pain pattern (p. 275)



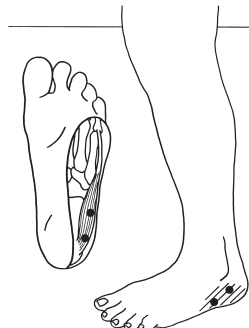
Extensor digitorum brevis and extensor hallucis brevis trigger points and referred pain pattern (p. 279)



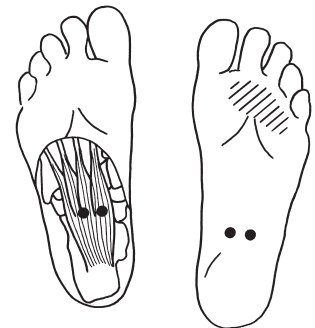
Sample interosseous trigger point and referred pain pattern. These muscles lie between each metatarsal. (p. 280)



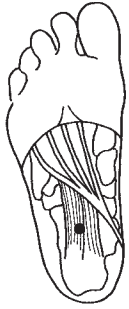
Abductor hallucis trigger points and referred pain pattern (p. 282)



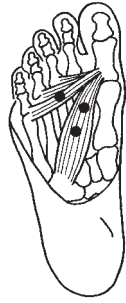
Abductor digiti minimi trigger points and referred pain pattern (p. 283)



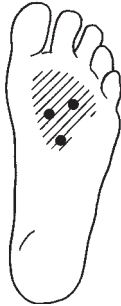
Flexor digitorum brevis trigger points and referred pain pattern (p. 284)



Quadratus plantae trigger point and referred pain pattern (p. 284)



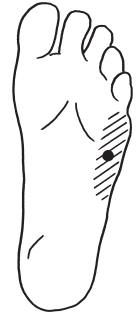
Adductor hallucis trigger points and referred pain pattern (p. 285)



Flexor hallucis brevis trigger points and referred pain pattern (p. 285)



Flexor digiti minimi brevis trigger point and referred pain pattern (p. 286)



Lower Leg, Ankle, and Foot Pain

Laura, age twenty-five, in New York City on vacation, developed incapacitating foot pain after walking all day on the concrete sidewalks, seeing the sights. She had to take a cab to an emergency treatment center, where she was advised to just take some Aleve and get off her feet. Even after resting and taking the pills, Laura's feet still hurt and she could barely hobble around her hotel room. She was very annoyed that each day "off her feet" was a day lost from her vacation.

A massage therapist who had an office in Laura's hotel showed her how to massage her lower legs to get rid of her foot pain. She'd already spent a great deal of time massaging her feet, but it hadn't helped very much. After massage to her calf and shin muscles, however, she could walk with almost no pain. By resting and continuing the massage throughout the evening and again the next morning, she was able to go out again on a somewhat reduced schedule; she also took more cabs and did less "hoofing it." She knew that the pain would probably come back because of the continued strain of walking, but now she knew what to do to combat it.

You may not have ever thought about it, but the eleven muscles of the lower leg are actually foot muscles. Anatomists call them *extrinsic* foot muscles, meaning they operate from outside the foot. The muscles in the foot itself are *intrinsic* foot muscles, meaning they work from inside the foot. The implication is that the pain in your feet may not be coming from your feet themselves. You can waste a lot of time rubbing and soaking your feet if the cause of your pain is trigger points in your calves and shins.

Trigger points in lower leg muscles also produce most ankle pain. Pain in the front of the ankle almost always comes from the shin muscles. Pain around the Achilles tendon in the back of the ankle is usually from the calf muscles. A sprained ankle is sometimes nothing more serious than referred pain from

You may not have ever thought about it, but the eleven muscles of the lower leg are actually foot muscles. . . . You can waste a lot of time rubbing and soaking your feet if the cause of your pain is trigger points in your calves and shins.

trigger points in the peroneus muscles of the outer side of the lower leg. Many problems of the ankles and feet that get labeled "tendinitis," "heel spur," "plantar fasciitis," or a "sprained ligament" can be fixed with simple massage of the muscles of the lower leg (Travell and Simons 1992).

Obviously, serious conditions resulting from physical trauma or congenital deformity do affect the ankles and feet of many people. Nevertheless, myofascial trigger points are very often part of the picture, even when other conditions exist. Knowing your trigger points will allow you to deal successfully and reliably with most kinds of pain in your lower legs, ankles, and feet.

Shin Muscles

There are three important muscles on the front of your lower leg (figure 10.1). These three shin muscles act to *dorsiflex* (raise) the foot and toes. This is a vitally important function in keeping the toes from dragging when you walk. The shin muscles also help accommodate the foot to uneven ground and keep you balanced when you're on your feet. Shin muscles weakened by trigger points are a major cause of tripping and stumbling, which can result in physical injury, a special concern for older people for whom a fall can mean broken bones and hospitalization (Travell and Simons 1992).

Pain from trigger points in the three shin muscles is sent to the front of the ankle and the top of the foot and toes. Myofascial pain in the big toe

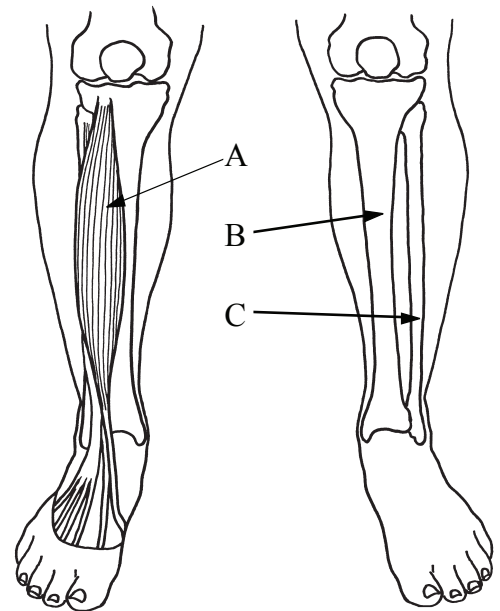


Figure 10.1 (A) shin muscles, (B) tibia, (C) fibula

from the shin muscles is sometimes mistaken for gout. Other problems traceable to trigger points are ankle weakness, night cramps, hammertoe, claw toe, and numbness in the top of the foot and the front of the lower leg (Travell and Simons 1992).

Chronic tension from trigger points in the shin muscles can result in *shin splints*, an extremely painful condition caused by stress on muscle attachments. Although the pain of shin splints is not the same as referred pain from trigger points, massage is the correct treatment, because it deactivates the trigger points and removes the chronic tension in the muscle (Travell and Simons 1992).

Shin muscles that are chronically swollen from the effects of trigger points can eventually produce *anterior compartment syndrome*, a very serious condition in which circulation is impaired and muscle tissue may die. There are four muscle compartments in the lower leg. Each one contains several muscles and is separated from the other compartments by thick sheets of connective tissue, which can severely limit the space inside. A compartment syndrome is characterized by general tightness and tenderness over the whole compartment area; the internal pressure in a compartment can rise to a level that will rupture its fascial covering, constituting an emergency that must be relieved surgically. Compartment syndrome is less likely to occur if myofascial trigger points are taken care of in a timely way (Travell and Simons 1992).

Tibialis Anterior

The word *tibialis* (tib-ee-AL-is) comes from *tibia*, the Latin word for “shinbone.” The tibialis anterior muscle lies along the outer side of your shinbone. Interestingly, people in Roman times made flutes from the shinbone, or tibia, of certain animals. Such an instrument was naturally called a “tibia.” If you’ve ever wondered why the flute stop on a pipe organ is called the “tibia,” that’s the ancient connection.

The tibialis anterior attaches to the top of the tibia and all along its upper half. Its long tendon descends parallel to the sharp edge of the shinbone. You can see this tendon stick out at the front of the ankle when you raise the front of your foot. The tendon crosses the top of the foot to its inner edge. It then wraps around to attach to bones on the underside of the foot.

The attachments of the tibialis anterior allow it to dorsiflex the foot and turn the bottom of the foot inward, an action called *inversion*. Dorsiflexion lets the foot clear the ground after you’ve taken a step and are bringing the foot forward for another. The actions of inversion and dorsiflexion are necessary for maintaining balance and adapting the foot to the surface beneath it. Understanding the effects of tibialis anterior trigger points may solve a number of otherwise very frustrating, unexplained problems in the feet and ankles, including weakness, stiffness, numbness, and pain. Consider that trigger points in the tibialis anterior muscles are one of the chief causes of “growing pains” in the feet and ankles of children. They’re no less common in adults. The two following cases illustrate typical problems originating in the tibialis anterior muscles (Travell and Simons 1992).

Diane, age fifty-nine, arrived at her computer class with severe pain in the front of her right ankle and on the top of her foot. She hadn’t been able to sleep the night before, and now she could hardly walk. The tightness in her face displayed her agony. A massage therapist who was also taking the class showed her how to massage a painful spot beside her shinbone. Within minutes, the intensity of the foot and ankle pain had subsided. To keep it from coming back, he showed her how to massage the spot herself with the heel of her opposite foot.

The cause of Diane’s pain was her habit of sitting at her computer with her feet under her chair. This position, with her toes touching the floor and bent up as far as they would go, cramped the muscles in the fronts of her lower legs for hours.

Andy, age eighty, had chronic pain in his big toe. His toes also tended to catch on steps and the edge of carpets, causing him to trip unexpectedly. He had almost fallen several times. Falling and breaking a hip was his greatest fear. So, for safety, he had begun using a cane. The doctor prescribed medicine for gout, though the tests hadn’t

confirmed that gout was the problem. The medicine didn't seem to help, however, and Andy's toe continued to hurt.

Trigger points were discovered in the muscles of the front of Andy's lower leg. Pressure on one particular spot reproduced the pain in his toe exactly. After massage, the pain was noticeably diminished. He found he was able to massage the spot himself with the rubber tip of his cane. With continued self-applied massage as needed, Andy stopped tripping over his own feet and his "gout" soon disappeared.

Symptoms

Trigger points in the tibialis anterior send pain to the top and inner side of the big toe and to the front of the ankle (figure 10.2). Walking makes the pain worse. Occasionally, pain may extend partway up the lower leg along-side the shinbone (not shown) (Travell and Simon 1992).

"Gout" and "turf toe" are labels often applied to pain in the big toe. Pain in the big toe doesn't automatically mean you have gout. The referral pattern for trigger points in tibialis anterior and extensor hallucis longus muscles includes the big toe and the head of the first metatarsal bone, the place where the toe joins the foot. The pain can feel as though it's actually in the joint. Physicians who are unaware of these effects are likely to prescribe gout medications for this pain, even when tests fail to confirm the condition.

True gout, the deposit of urate crystals in the joints, is caused by uricemia, too much uric acid in your blood. A diet of too much meat and too little water is likely to promote uricemia. Gout and the trigger points that mimic gout often coexist, and uricemia can make your trigger points hard to get rid of. A vitamin C deficiency makes both conditions hard to get rid of.

Falls and presumed balance problems may actually be the result of the weakening effect that trigger points have on the tibialis anterior muscles. A weak tibialis anterior allows the foot to drop when it shouldn't. This can cause tripping and stubbing of toes on level ground and stumbling while climbing stairs. This effect can put the elderly in serious jeopardy, ending in broken bones or even worse injuries. No matter your age, if you tend to "trip over your own feet," you should check the fronts of your lower legs for trigger points. Foot drop can also be caused by a compressed nerve in the spine. If the foot drop is severe, it is more likely to come from the spine. Trigger points in the tibialis anterior and peroneus longus may persist after the compression at the spine is relieved. In this case, massage to the trigger points in these muscles should help (Travell and Simons 1992).

The pain patterns of several other muscles overlap that of the tibialis anterior. In seeking the cause of pain in the front of the ankle and the top of the foot and toes, troubleshoot all six muscles of the front of the lower leg and top of the foot. Besides the tibialis anterior, these include the peroneus tertius, extensor digitorum longus, extensor hallucis longus, extensor digitorum brevis, and extensor hallucis brevis (Travell and Simons 1992).

Anterior compartment syndrome has similar symptoms but is not caused by trigger points. Symptoms include diffuse tenderness and tightness over the entire tibialis anterior muscle. Pain, numbness, and tingling can spread down to the foot and around the outside of the leg. Massage does not feel good and does not help. If you have these symptoms, it is important to see a physician right away.

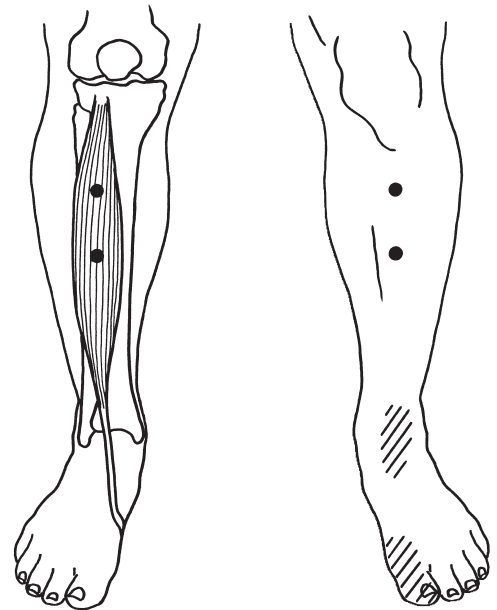


Figure 10.2 Tibialis anterior trigger points and referred pain pattern

Causes

The tibialis anterior muscles can be overloaded by strenuous running, walking, and climbing. Changing your running or walking style can also put the tibialis anterior muscles under stress. Walking on rough ground can strain all the muscles of the lower leg, including the tibialis anterior. Driving for long periods with the foot constantly on the accelerator is prone to make trigger points in this muscle (Travell and Simons 1992).

Trigger points in the calf muscles make the muscles of the front of the lower leg work harder and cause them to tire very quickly. Conversely, trigger points in the front of the leg overtax the back of the leg. Such overburdening of the muscles continued over a length of time can predispose you to compartment syndromes in both areas, which can do permanent damage to the muscles. Chronic trigger points in the tibialis anterior itself are also a root cause of shin splints and stress fractures of the tibia (Travell and Simons 1992).

Treatment

The tibialis anterior muscle is found just to the outside of the shinbone. Confirm its location by feeling it contract when you raise the front of your foot (figure 10.3). Trigger points in the tibialis anterior occur approximately one hands width below the kneecap and about one-third of the way down the leg from the knee. They can be very deep in this thick muscle. The difficulty in massaging them is in getting the leverage to exert adequate pressure. Supported fingers work well, provided you trim your nails so you can employ the very tips (figure 10.4). If you're reluctant to sacrifice your nails, try a Knobble or any handheld massage tool, applying pressure with both hands. The Thera Cane is excellent for this job if you employ the shaft instead of the knobs, which are a bit too hard for this sensitive area (figure 10.5). Any stick-type tool such as The Stick, Tiger Tail, or the handle of a broom will work well.

Possibly the best trick for working the tibialis anterior—if you're limber enough—is to use the heel of the opposite foot as a tool. While sitting on a floor or on the bed, hold the foot with both hands and drag it toward you



Figure 10.3 Locating tibialis anterior by isolated contraction

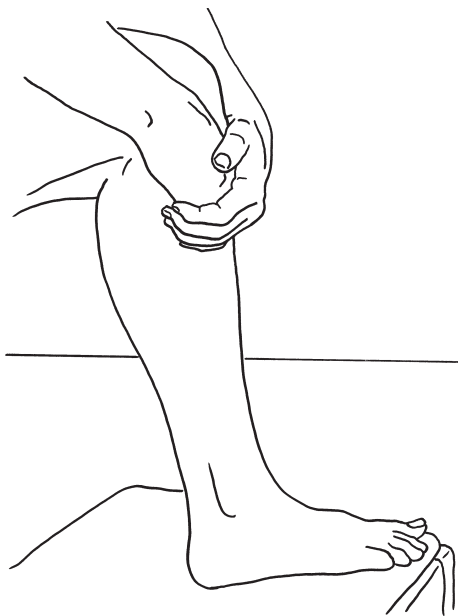


Figure 10.4 Tibialis anterior massage with supported fingers

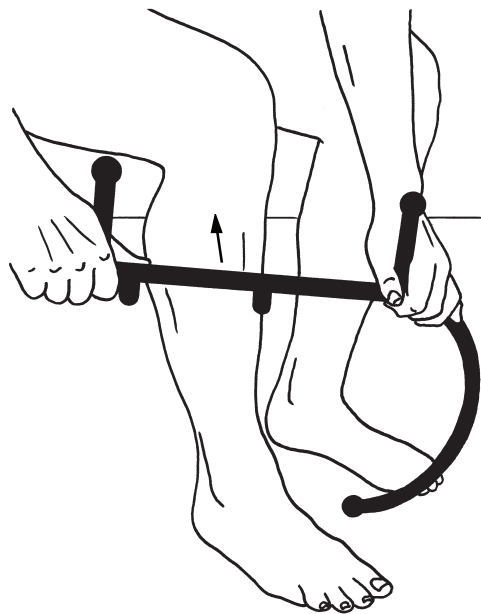


Figure 10.5 Tibialis anterior massage with Thera Cane

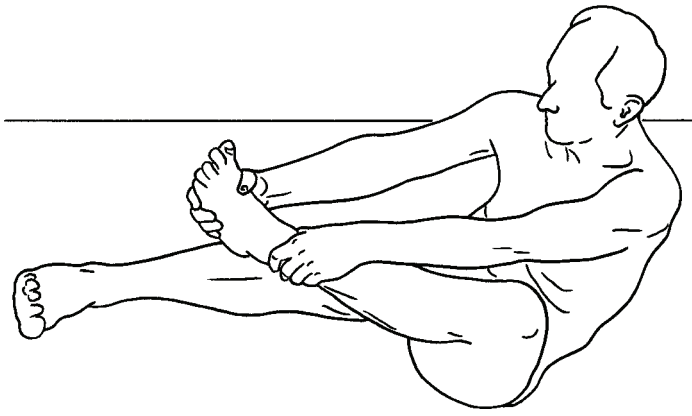


Figure 10.6 Tibialis anterior massage with the heel as the tool

over the muscle (figure 10.6). You can also use the heel when you're sitting on the edge of the bed or in a chair (figure 10.7). In this case, you'll be pushing your foot away from you, down your leg.

When you've had trouble with the tibialis anterior, check for trigger points in the other muscles of the leg. The imbalances they cause can make it necessary for tibialis muscles to carry an extra load. View any small incident of tripping as a sign that latent trigger points may be limiting the actions of the shin muscles.

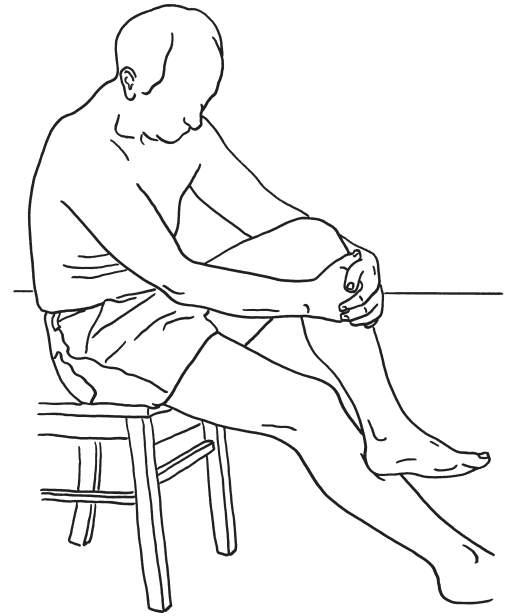


Figure 10.7 Tibialis anterior massage with heel

Extensor Digitorum Longus and Extensor Hallucis Longus

The *extensor digitorum* (dih-jih-TAW-rum) *longus* and *extensor hallucis* (HAL-uh-sis) *longus* muscles lie between the tibialis anterior and the peroneus longus. The extensor digitorum longus attaches to the top of the tibia and to nearly the entire length of the fibula. The other end of the muscle attaches by four separate tendons to the bones of the four smaller toes. The extensor hallucis longus also attaches to the fibula, beginning at that bone's midpoint. It then descends to attach to the bones of the big toe.

Both toe extensors help dorsiflex, or raise, the front of the foot. The extensor hallucis longus also aids in turning the sole of the foot inward (*inversion*). The extensor digitorum longus provides some of the force that turns the foot outward (*eversion*). All three actions—dorsiflexion, inversion, and eversion—adapt the foot to the ground and help you keep your balance when on your feet.

Trigger points in these long extensors of the toes are very common in both children and adults. The pain they cause in the ankles and feet is typically blamed on tendinitis. Treatments such as exercise, stretching, and rest often fail to produce results. Ben's and Barbara's stories typify problems with the toe extensors (Travell and Simons 1992).

Ben, age forty-six, had constant pain in the top of his left foot and the lower part of his shin. His ankle was so weak that he had difficulty raising his foot. Any attempt to do so greatly increased his pain. The immediate problem was that he was unable to pull up with his foot to shift gears on his motorcycle. As a consequence, he'd had to drop out early from a long-anticipated weekend tour with his motorcycle club.

Trigger points were found in the front of Ben's left lower leg, in muscles being overused in shifting gears. Tightness in the muscles caused pressure on the nerve that supplied motor impulses to the muscles, leaving them unable to make a strong voluntary contraction. Self-applied massage immediately stopped the pain in the top of his foot and over several weeks brought back the strength in the muscles.

Barbara, age seventy, was often awakened in the night by cramps in the fronts of her lower legs. The tops of her feet hurt most of the time and she couldn't straighten her toes, which stayed curled up like claws. She tended to walk flatfooted because of recurrent pain in the bottoms of her feet.

Extremely tender trigger points were found in the fronts of Barbara's lower legs. After professional treatment and instruction, she was able to stop the night cramps with self-applied massage to the fronts of her legs. Three weeks of an established routine of massage morning and night eliminated the pain in the tops of her feet. Eventually, her toes began to relax, too. Deep massage to her calf muscles and the soles of her feet brought additional relief.

Symptoms

Trigger points in the extensor digitorum longus send pain primarily to the top of the foot, though it may sometimes extend to the tips of the four smaller toes and up the front of the ankle (figure 10.8). This distribution of pain overlaps that of the tibialis anterior, peroneus tertius, extensor digitorum brevis, and interosseous muscles. This makes it important to very accurately determine exactly where you feel the pain (Travell and Simons 1992).

Tension in the extensor digitorum longus sometimes puts pressure on the deep peroneal nerve, which supplies motor impulses to all the muscles of the front of the lower leg. This impingement can cause severe weakness in these muscles and make it difficult to raise the foot. Compression of the deep peroneal nerve produces a distinctive patch of numbness in the top of the foot, at the base of the first and second toes (Travell and Simons 1992).

Trigger points in the extensor hallucis longus cause pain in the big toe, centered on the head of the first metatarsal bone, the place where the toe joins the foot (figure 10.9). Occasionally, pain may extend to the front of the ankle and can feel as though it's actually in the bone (not shown) (Travell and Simons 1992).

Chronically tight toe extensor and flexor muscles contribute to the development of hammertoe and claw toe. These are conditions in which the toes are cramped and drawn up and can't be straightened either actively or passively. Permanent deformity of the foot can result if the muscles go untreated. Unrelieved tightness in the toe extensors also leads to recurrent night cramps (Travell and Simons 1992).

Causes

The extensor muscles can be strained by the momentary overload that occurs when you stub your toe or kick a ball. The toe extensors are easily overworked by operating the gas and brake pedals if you do a lot of city driving. Pedaling a bike is another activity that may tire them excessively. Climbing long flights of stairs can exhaust the toe extensors, since they have to contract hard with each step in order for the toes to clear. Trigger points can also be set up by the inactivity imposed by a cast after a bone break (Travell and Simons 1992).

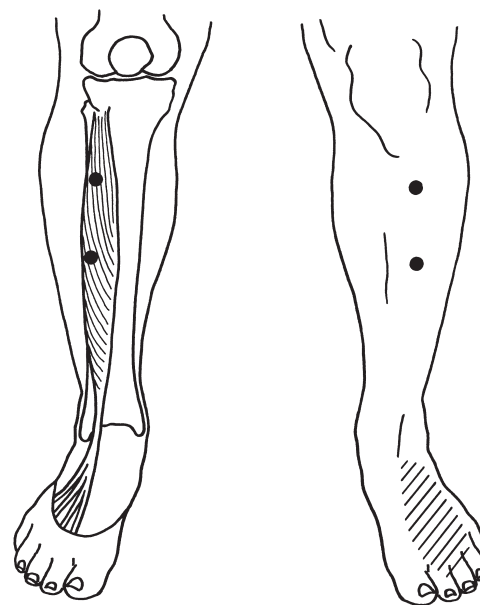


Figure 10.8 Extensor digitorum longus trigger point and referred pain pattern

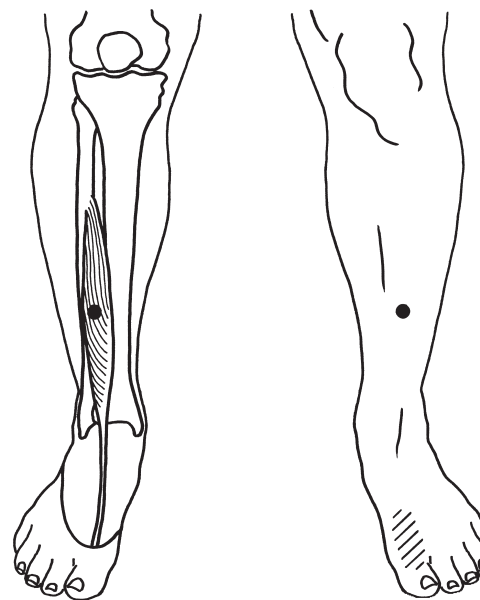


Figure 10.9 Extensor hallucis longus trigger point and referred pain pattern

Treatment

Search for the belly of the extensor digitorum longus about a hand's width below the lower edge of the kneecap. The extensor digitorum longus trigger point will be about an inch to the outside and slightly higher than the tibialis anterior trigger point. This point is about halfway between the front and the side of the leg. To contract the extensor digitorum longus by itself, raise the toes without raising the front of the foot (figure 10.10).

Look for extensor hallucis longus trigger points halfway between the knee and the ankle, an inch or so to the outer side of the shinbone. Feel the muscle contract when you raise your big toe (figure 10.11). When it does, you can see its tendon stand out on the front of the ankle between the tendons for the tibialis anterior and extensor digitorum longus.

Since the toe extensor muscles are so deep, you may find your heel ineffective as a massage tool. The Knobble, Thera Cane, or supported fingers may do better. You may find standing with your foot up on a chair to provide the best leverage.

To be really good to your lower legs, give up wearing high-heeled shoes. They keep several lower leg muscles in a shortened state and put you at risk for overstretching or overcontracting muscles, should you lose your balance. Most shoes sold these days have very thick, tall heels, even men's shoes. This trend is not good for the foot, leg, or low back. Take care to keep the muscles from getting chilled, as being cold keeps the muscles tense and perpetuates trigger points. If you have recurrent trouble with your shin muscles, beware of too much running or walking, particularly up and down hills. When you're in the midst of trouble with them, take the elevator—stay off the stairs.

To be really good to your lower legs, give up wearing high-heeled shoes.



Figure 10.10 Locating extensor digitorum longus by isolated contraction



Figure 10.11 Locating extensor hallucis longus by isolated contraction

While massaging a trigger point, aim for a 5 on a pain scale of 1-10 (where 1 is no pain and 10 is shouting ouch and quitting). At a 5 you should be able to relax into the sensation and breathe normally. It is a little bit painful but you like it.

Peroneus (Fibularis) Muscles

The three *peroneus* (pair-uh-NEE-us) muscles are found on the outer side of the lower leg (figure 10.12). The word “peroneus” derives from the Greek word for “pin.” The peroneus muscles all attach to the fibula, the thin, pin-like outer bone of the lower leg. The Latin word “fibula” also means “pin.” Occasionally, terminology changes to help better identify anatomical structures. The newest name for the peroneus muscles is *fibularis*.

Trigger points in the peroneus muscles produce a great part of the pain that occurs on the outer side of the ankle. Many times, a sprained ankle, particularly one with little or no swelling, is nothing more than referred pain from the peroneus muscles. If massage to the peroneus muscles gets rid of the pain, it’s unlikely that you’ve suffered ligament injury (Travell and Simons 1992).

The action of all three peroneus muscles is eversion—turning the bottom of the foot outward and the ankle inward. An extreme degree of the opposite action, inversion, turning the bottom of the foot inward and the ankle outward, is what causes most outer ankle sprains. When this happens, the peroneus muscles are severely overstretched. Their typical response is to produce trigger points and tighten up in self-defense. When this overstretching is bad enough, ligaments and tendons can be torn. In such a case, the added pain and stiffness from peroneus trigger points help discourage you from moving your ankle, clearly a protective device (Travell and Simons 1992). If you do damage the ligaments or tendons, focus on massaging the peroneus muscles while they heal.

Paradoxically, immobilization for an ankle injury tends to perpetuate trigger points in the peroneus muscles, causing them to long outlast the original injury. Persistent trigger points take the stretch out of the peroneus muscles and make new injuries almost inevitable. The ankle becomes weak and unstable, and sprains become more frequent and fractures more likely. Athletes are particularly vulnerable when trigger points handicap the peroneus muscles (Travell and Simons 1992).

Under extreme conditions, the peroneus muscles can become so swollen and tight that they make the pressure intolerably high in the fibrous envelope that surrounds them. Lateral compartment syndrome can be the result, which, if it persists, may permanently damage the peroneal nerves unless you have surgery to relieve it.

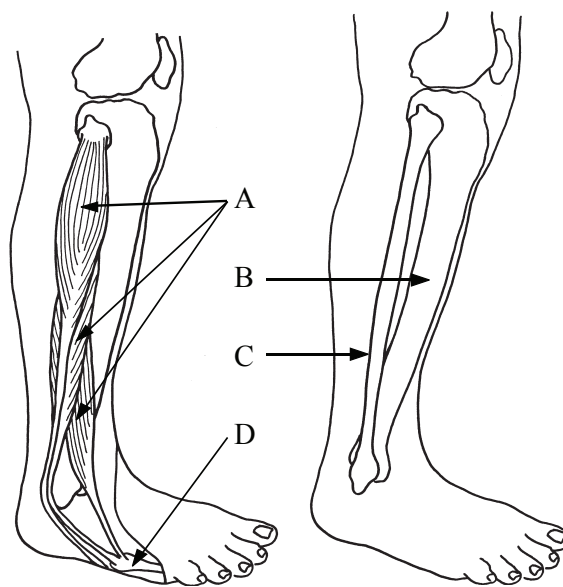


Figure 10.12 (A) peroneus muscles, (B) tibia, (C) fibula, (D) fifth metatarsal

Peroneus (Fibularis) Longus

The longest and largest of the three peroneus muscles, the *peroneus* (pair-uh-NEE-us) *longus* is the one most often afflicted by trigger points. When you have ankle pain, think first of the peroneus longus.

The peroneus longus attaches to the head of the fibula and the upper two-thirds of its shaft. Its lower attachment is quite unusual: the tendon travels behind the *lateral malleolus* (the outer anklebone) and then crosses diagonally beneath the foot clear over to the inner side. There, it fastens to the underside of the base of the first metatarsal and one of the tarsal bones. (*Metatarsals* are the bones in the front half of your foot, not including the toes. *Tarsals* are the bones of the ankle.) These attachments enable the peroneus longus to point the foot downward and turn the sole outward

When you have ankle pain, think first of the peroneus longus.

(eversion). This is an action vital to walking, running, and climbing. You can feel the power of the peroneus longus under the ball of your foot as it helps impel you forward.

Many muscles, including the three peroneus muscles, automatically contract as they lengthen in order to balance and control the forces being applied by their antagonists, the muscles that work in the opposite direction. Peroneus muscles consequently do double duty, contracting while shortening and then again while lengthening. This can be very tiring for muscles that are constantly in use. Because the peroneus muscles are so important to all activities of the foot, they are among the first to develop symptoms of overload, fatigue, and abuse.

Symptoms

Rachel, age twenty-seven, twisted her ankle and fell in her living room while dancing to Sesame Street music with her small children. The severe pain took her right to the emergency room. A chipped bone in her ankle was discovered on X-ray, apparently torn loose by a strained ligament. Three weeks in a walking cast let the damaged bone heal, but pain and stiffness persisted for several months. She continued to have difficulty standing for any length of time, and walking brought immediate pain on the outside of her ankle.

Trigger points were found in all the muscles of Rachel's lower leg. Pressure on a trigger point in her peroneus longus reproduced her ankle pain exactly. She learned to massage the outer side of her lower leg and was able to ease her ankle pain in just a few minutes whenever it started up. Within a month, pain ceased to be a problem.

Trigger points in the peroneus longus muscle project pain to the outer side of the ankle (figure 10.13). Pain focuses on and under the *lateral malleolus*, the outer anklebone or knobby end of the fibula that sticks out on the side of the ankle. *Malleolus* (mah-LEE-uh-lus) means “little hammer” in Latin. Pain occasionally occurs in the middle third of the outer lower leg and along the outer side of the foot (not shown). The ankle is usually diffusely tender to the touch, which differs from the sharply localized tenderness of a torn ligament or stress fracture. Symptoms of pain and tenderness in the ankle are often mistaken for signs of arthritis. Tendinitis is a common misdiagnosis (Travell and Simons 1992).

Ankle weakness is characteristic of the effects of peroneus trigger points. In addition, nerve impingement by the tight peroneus longus muscle can cause numbness in the lower leg, ankle, and top of the foot. Weakness in the muscles from nerve compression may make it hard to lift the front of your foot. When nerves are involved, weakness can occur with or without pain. These symptoms can be confusingly similar to those of nerve entrapment in the spine caused by a ruptured disk. Treating trigger points in peroneus muscles will not stop your symptoms if there is a ruptured disk. Once the nerve entrapment is resolved, residual trigger points in the peroneus longus can be released. Also see the tibialis anterior for similar symptoms (Travell and Simons 1992; Jeyaseelan 1989).

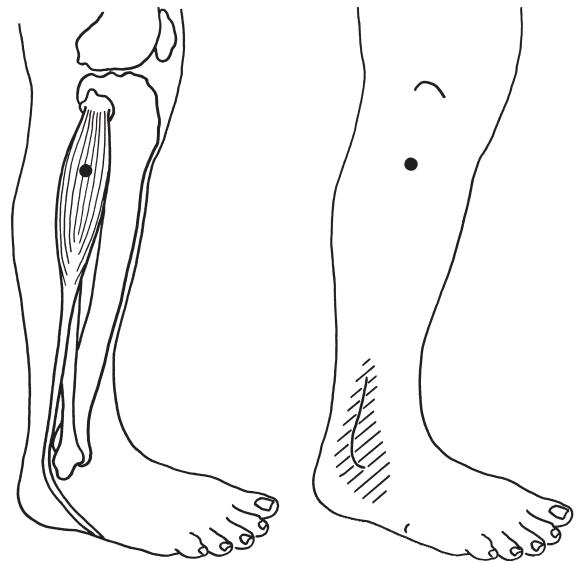


Figure 10.13 Peroneus longus trigger point and referred pain pattern

Causes

Walking, running, and climbing, when done to excess, predictably create trigger points in the peroneus longus muscles. Walking is even worse for these muscles if you have a short leg, flat feet, or Morton's foot syndrome. (See the section on the feet for more information about Morton's foot.) Sleeping on your stomach or back with your toes pointed is bad for peroneus longus muscles because it keeps them in a shortened state. If you're not afflicted with

too much compulsion for orderliness, try untucking the covers at the foot of the bed to give your feet and toes more freedom. Wearing high-heeled shoes puts shin muscles under increased stress by keeping them shortened and tight. In high heels, the weight of the body is thrown forward onto the toes, and peroneus muscles must stay contracted to maintain balance (Travell and Simons 1992).

Therapeutic stockings or tight ankle socks put pressure on peroneus muscles and promote the formation of trigger points. Sitting with crossed legs can cause pressure on the peroneal nerves, which can lead to numbness and muscle weakness. Squatting compresses nerves and blood vessels alike, in addition to putting abnormal strain on a number of muscles, including the peroneal group. Trigger points are encouraged when you hold any extreme posture too long (Travell and Simons 1992).

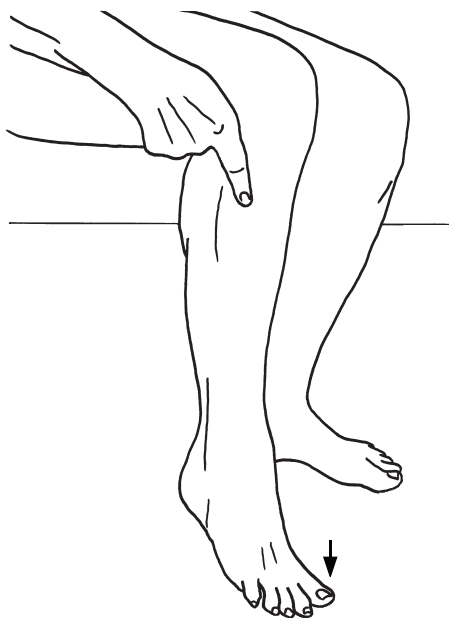


Figure 10.14 Locating peroneus longus by isolated contraction

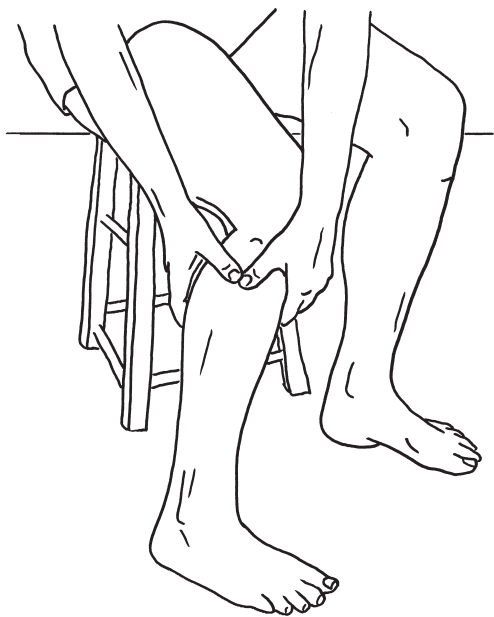


Figure 10.15 Peroneus longus massage with paired thumbs

Treatment

Peroneus longus trigger points are found about a hand's width down from the knee. They will be approximately in a line with the trigger points in the tibialis anterior. Confirm the location of the peroneus longus by feeling it contract when you turn the sole of your foot outward. You can make it contract harder by pointing your toes at the same time (figure 10.14).

To gain greater access to all the peroneus muscles for massage, put your foot up on a chair. Another good position is sitting on the bed with the leg up on the bed with you. Massage the peroneus longus with paired thumbs using short, slow strokes (figure 10.15). You may be able to use supported fingers also, but you'll see that the muscle tends to roll off the fibula when you press on it. Paired thumbs let you trap it and hold it still. The Thera Cane works well if you employ the shaft instead of one of its knobs, just like with the tibialis anterior (figure 10.5). Massage while lying on your side with a ball on the muscle works, too (figure 10.16). You'll easily find a trigger point centered on the bone, but note that the muscle wraps around the fibula: you'll often find a trigger point in the back edge of the muscle at the back edge of the bone.

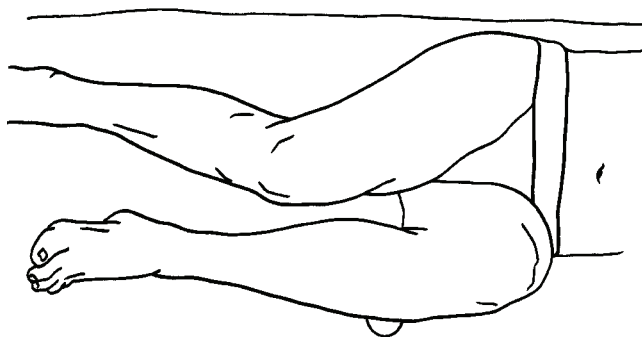


Figure 10.16 Peroneus longus massage lying on side with ball. Move the leg forward and back over the ball.

You may not be able to keep from having trigger points in your peroneus muscles if you're an active person, but you should be aware that there's a special danger in ignoring chronic trigger points in these important muscles. Trigger point–sponsored weakness and inflexibility in the peroneus muscles leave you vulnerable to serious ankle injury, such as ruptured tendons, broken bones, and torn ligaments. To avoid these calamities, work on your trigger points at the first sign of pain in the outer side of your ankle. If your ankles seem weak and you're always suffering little sprains, it's a sign that latent peroneus trigger points are present and need to be attended to.

If you have Morton's foot, you will be prone to turning your ankle and causing trigger points in these muscles. (See the section "Morton's Foot Syndrome and Elevated First Metatarsal" later in this chapter.)

Peroneus (Fibularis) Brevis

Trigger points are found less often in the *peroneus* (pair-uh-NEE-us) *brevis* than in the peroneus longus, but don't let this fact lull you into overlooking them. Pain from peroneus brevis trigger points occurs in a pattern similar to that of the longus but tends to extend farther along the outer side of the foot since the muscle attaches there to the base of the fifth metatarsal (figure 10.17). (The little knob you can feel in the middle of the outer edge of your foot is the end of the fifth metatarsal.)

Locate the peroneus brevis by feeling it contract immediately in front of the peroneus longus tendon when you lift the outer edge of your foot (evert) at the same time as you point your foot (dorsiflex) (figure 10.18). This will be about a third of the way up the lower leg from the ankle. Massage the peroneus brevis at this point with the same tools you would use with the peroneus longus.

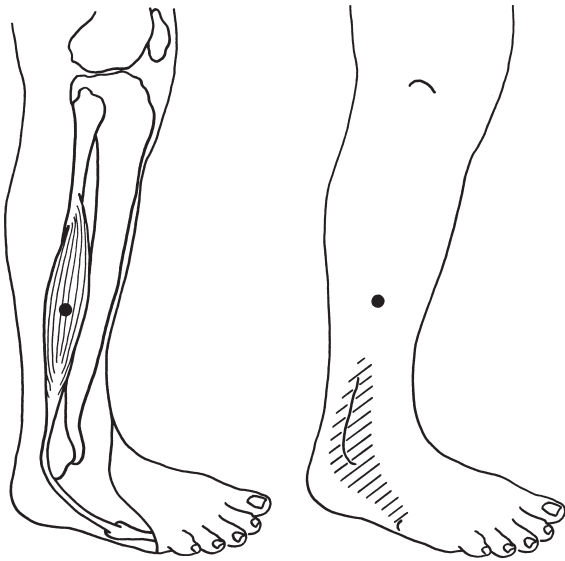


Figure 10.17 Peroneus brevis trigger point and referred pain pattern

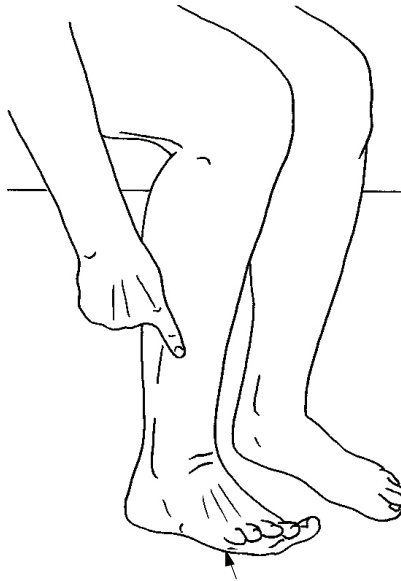


Figure 10.18 Locating peroneus brevis by isolated contraction

Peroneus (Fibularis) Tertius

The *peroneus tertius* (pair-uh-NEE-us TER-shus) is a very special muscle simply because it is so well hidden. Peroneus tertius trigger points will make your ankle pain and weakness persist after everything else has been fixed.

The peroneus tertius attaches to the front of the lower half of the fibula bone. Its tendon passes in front of the lateral malleolus, or outer anklebone, to attach to the top of the base of the fourth and fifth metatarsals. This muscle's action is to turn the sole of the foot outward and to raise the front of the foot. The peroneus tertius can be a surprisingly large muscle, sometimes approaching the size of the extensor digitorum longus. The muscle is absent, however, in approximately 8 percent of the population. One person in seven has a fourth peroneus muscle, the peroneus quartus, located behind the lower end of the fibula. Its trigger points would be found between the fibula and the Achilles tendon, and its pain pattern would be similar to that of the peroneus longus.

Trigger points in the peroneus tertius cause pain in front of the lateral malleolus (outer ankle) and on the outer side of the heel (figure 10.19). Characteristically, a surge of pain is felt with every step. Ankle weakness usually accompanies the pain. These symptoms are commonly misinterpreted as a sign of ligament injury, tendinitis, or osteoarthritis (Travell and Simons 1992; Reynolds 1981).

Locate the peroneus tertius above and just in front of the lateral ankle. Find the outer ankle and the front of the leg, and then measure about three to four inches up toward the knee. Feel the muscle contract when you turn the sole of your foot outward at the same time as you raise the front of your foot (figure 10.20). This is the belly of the peroneus tertius; feel for exquisite tenderness and you will have found the trigger point.

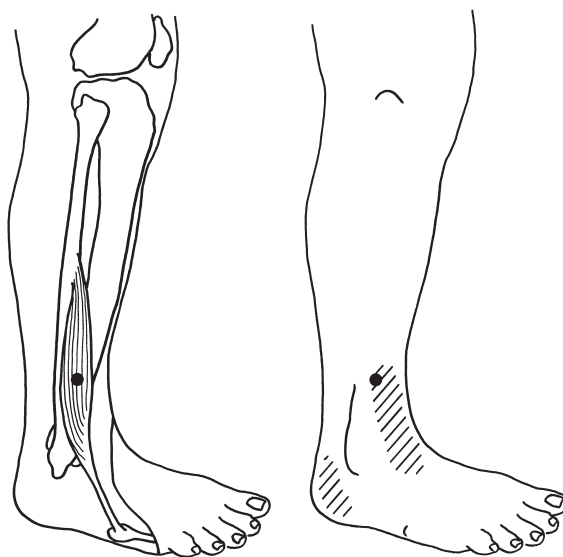


Figure 10.19 Peroneus tertius trigger point and referred pain pattern



Figure 10.20 Locating peroneus tertius by isolated contraction

The hardest part of this therapy is getting yourself to do it. Every time you do your self-treatment, pat yourself on the back and say, "Good job, me! Way to go!" This should not turn in to some chore that you dread doing.

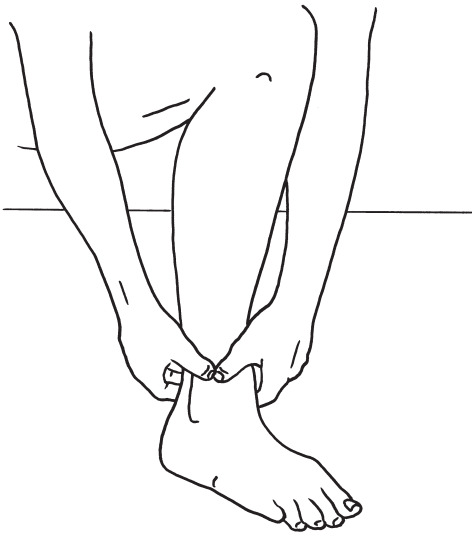


Figure 10.21 Peroneus tertius massage with paired thumbs



Figure 10.22 Peroneus tertius massage with ball on the edge of a bed

Massage the peroneus tertius with supported fingers or paired thumbs (figure 10.21). A great way to massage the peroneus tertius and peroneus brevis at the same time is with a tennis or high bounce ball on the edge of a bed (figure 10.22). This position is particularly effective because you can use the weight of your leg to provide the force. This saves the fingers for work that only the fingers can do.

Calf Muscles

There are five muscles in the calf, separated as a unit into the posterior compartment by fibrous partitions. The muscles of the posterior compartment are strong and thick, even on slender individuals, and provide the major force for lifting the body to stand and propelling it forward to walk or run. They also participate in maintaining balance.

Trigger points in the calf muscles predictably foster calf cramps and cause pain in the ankles and the calves themselves. But you may be surprised to know that the calf muscles are also responsible for at least half of the pain felt on the bottoms of the feet and virtually all the pain felt around the Achilles tendon in the back of the ankle, pain that is so often blamed on the tendon itself (Travell and Simons 1992).

A Word of Caution

In addition to pain, if you are experiencing redness, swelling, local itchiness, or heat in the calf, it is wise to consult a physician immediately. These can be symptoms of deep vein thrombosis or a blood clot in the leg. Any massage could dislodge the blood clot and cause it to travel to the lungs (Werner 2013). It is also advisable to avoid massaging varicose veins, as they can also develop blood clots.

Gastrocnemius

The accepted pronunciation of *gastrocnemius* (gas-trock-NEE-me-us) is actually somewhat at odds with the word's derivation. It should probably be pronounced gas-tro-NEE-me-us. *Gastro* clearly comes from the Greek word for “stomach.” *Cnemius* is from the Greek *kneme* (NEE-me) with a silent “k,” which means “shank” or “lower leg.” *Gastrocnemius* literally means “stomach of the lower leg.” Take another look at your calves and you’ll see why: it’s the gastrocnemius muscles that give the calves their bellied contour.

The gastrocnemius muscle attaches to the lower end of the femur just above the back of the knee. Halfway down the back of the lower leg, the muscle joins the Achilles tendon, which then attaches to the heel bone. Because of the orientation of the muscle fibers in the gastrocnemius muscles’ two heads, they have the power to lift the entire weight of the body. This power is needed for jumping, climbing, and the controlled descent of stairs and hillsides. Finer functions include stabilizing the ankle and knee joints and manipulating the feet for balance. Interestingly, the gastrocnemius muscles actually contribute very little to propelling the body forward, helping mostly in spurts of motion.

Ironically, signs of gastrocnemius trouble may be felt only in the feet. The logic of referred pain is evidently to make you hurt where you're most likely to pay attention and stop whatever activity is causing the muscle abuse. This is what one young woman experienced in the midst of a well-earned vacation.

April, age twenty-two, was to spend five marvelous weeks traveling around Europe after graduating from college. Unfortunately, during her first few days, she walked everywhere in shoes with two-inch platform heels and developed disabling pain in the arches of her feet. Every night in the hostels and hotels, she soaked her feet in hot water and gave them a good rub, but the next day, after walking only a short distance, the pain came back as bad as ever. She knew the high heels were bad for her feet, but it didn't seem to help much to change to low heels after the pain started. The pain actually seemed to get worse, and it was ruining her vacation.

A guidebook suggested massaging her calves to get rid of her foot pain. It made no sense to April, but she tried it anyway out of desperation. Amazingly, it worked. She made time at night and in the morning to massage the backs of her legs and then to carefully stretch them. Her feet, legs, and ankles responded by getting stronger with walking and climbing instead of reacting defensively by developing trigger points. Within a few days, pain ceased to be a problem.

Symptoms

Pain in the long arch of the foot is the primary symptom of trouble in the gastrocnemius muscle (figure 10.23). Pain from the number 1 trigger point may also sometimes extend to the back of the thigh or knee, and up the inner ankle (not shown). Trigger points at other places in the gastrocnemius cause pain mainly in the muscle itself (figure 10.24). The highest lateral outer trigger point, however, sometimes sends pain to the outer side of the heel (not shown). When trigger points shorten the muscle, it may be hard to straighten the knee with the heel on the floor. Children very often have these same symptoms from myofascial trigger points (Travell and Simons 1992).

Trigger points toward the middle of the muscle are more likely to bring on night cramps in the calves than are those higher up. It's important to remember that nocturnal calf cramps can have many contributing causes, including vitamin deficiency, drug side effects, and poor circulation. Cramping can also occur while you're walking or running because of impeded circulation caused by muscle tightness. To relieve a calf cramp, straighten the knee and slowly flex the foot actively (or passively while holding your foot). This works best while lying down (Travell and Simons 1992).

Serious medical problems are often indicated by the same symptoms displayed by gastrocnemius trigger points. These include rupture of vertebral disks, tendon rupture, posterior compartment syndrome (which can cut off circulation), phlebitis, and cysts in the pocket behind the knee. Symptoms of gastrocnemius trigger points, however, can be misinterpreted as signs of any of these conditions when the practitioner is unaware of myofascial causes (Travell and Simons 1992).

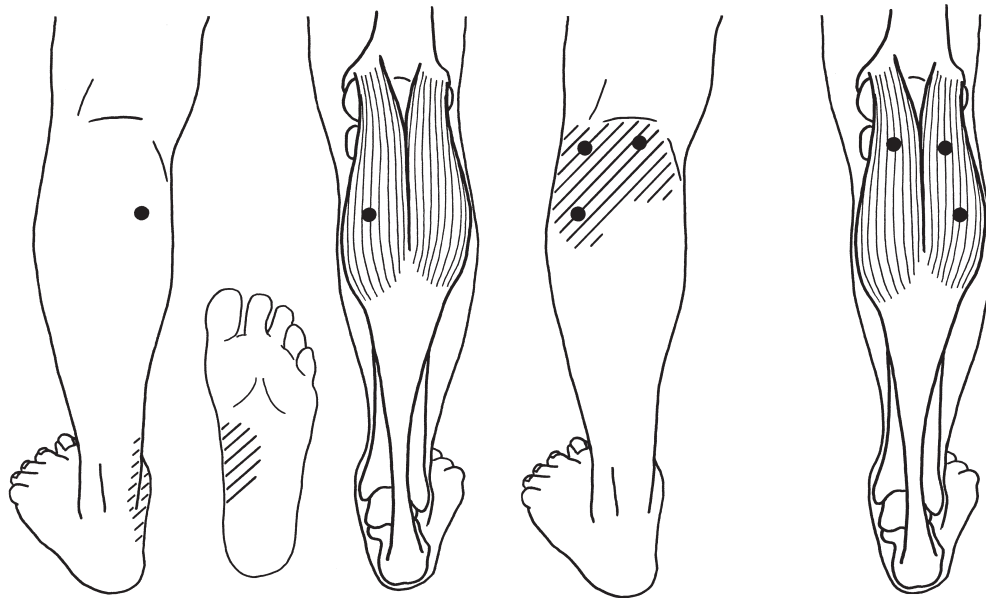


Figure 10.23 Gastrocnemius number 1 trigger point and referred pain pattern

Figure 10.24 Other gastrocnemius trigger points and local pain pattern

Causes

Climbing, walking uphill, or bike riding can overwork gastrocnemius muscles. On the job, leaning forward while standing for extended periods of time will wear them out and promote the formation of trigger points. Other causes include swimming with the toes pointed in the flutter kick, driving without cruise control, and sitting in chairs that restrict circulation by putting pressure on the backs of the thighs. Footstools or recliners that put pressure on the calves are a leading cause of trouble in calf muscles. Immobility from having the leg in a cast and poor conditioning from lack of exercise also lead to the establishment of trigger points. Viral illnesses often leave calf muscles tight and vulnerable to overuse. Chilling predisposes them to strain. Sleeping with the toes pointed keeps them in a shortened state and promotes cramping. You might curtail this hazard by not tucking the covers in at the foot of the bed. Wearing high-heeled (or thick-heeled) shoes will keep this and all of the muscles of the calf in a shortened position (Travell and Simons 1992).

Treatment

The location of the gastrocnemius on the upper half of the lower leg is usually well defined by the shape of the calf. You can also feel the belly of the muscle with your fingers as it bulges up when you point your toes.

For very focused, precise work on the gastrocnemius muscles, use supported fingers, the Knobble, or the Thera Cane; the shaft of any stick-type tool will work for more general treatment. When using any of these tools, make it easy on your back by putting your foot up on a bed or a chair (figure 10.25).

Deep stroking massage with the opposite knee is particularly effective for the entire back of the lower leg and is easy to do. This technique works well when you're either lying down or sitting up (figures 10.26 and 10.27). If sitting up, clasp your hands around your knee to support your leg and lower back. Simply move the leg down over the knee along three or four parallel lines, starting at the back of the ankle and going all the way to the back of the knee. When you encounter a trigger point, do extra work on that spot, going over it repeatedly with short strokes. Try massaging along the muscle and also across it. For concentrated work,



Figure 10.25 Calf massage with supported fingers

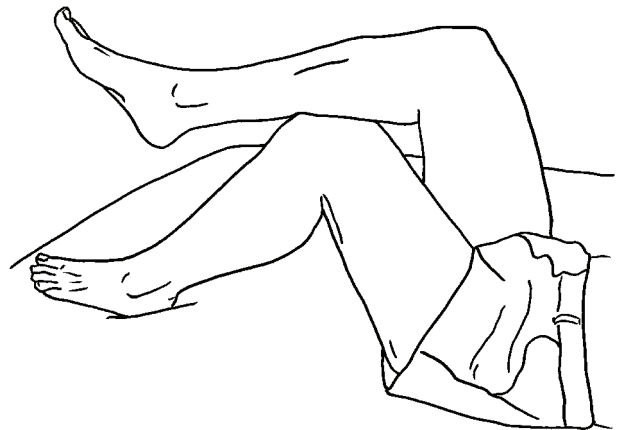


Figure 10.27 Calf massage with opposite knee while lying down

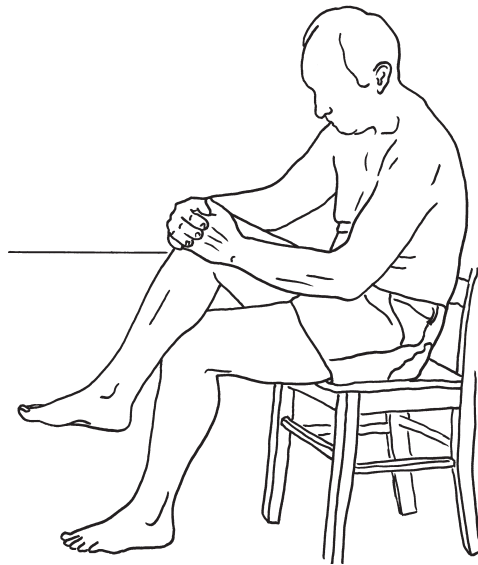


Figure 10.26 Calf massage with opposite knee while sitting. Be sure to support the upper body by holding the knee with both hands.

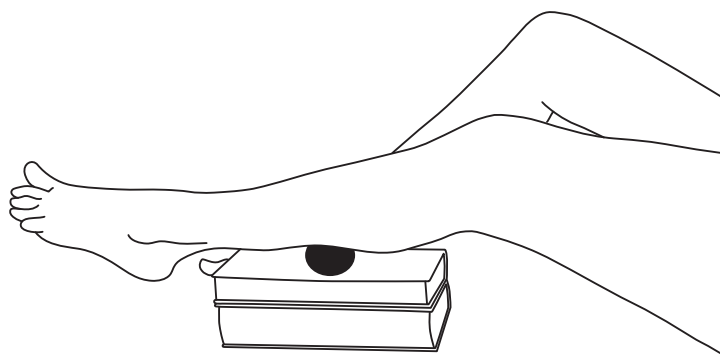


Figure 10.28 Calf massage with a ball on a stack of thick books. Avoid massaging the back of the knee with any tool other than your hands.

pressure into the calf.

Poor conditioning is probably the biggest reason for problems with the calf muscles. When they have become weak and inflexible, they are easily overworked or overstretched. Remember that even therapeutic stretching can be harmful when trigger points insist on keeping a muscle tight.

Soleus

The *soleus* (SO-lee-us) is a large, broad muscle that covers all of the back of the lower leg. Its lower half is immediately beneath the skin; its upper half is hidden by the gastrocnemius. The word “soleus” derives from the Latin word for “sandal.” It has the same root as “sole,” the word for the bottom of the foot and for the popular flatfish that’s also sometimes called “flounder.” The soleus muscle is broad and flat, not unlike the flounder.

The soleus muscle attaches to the upper parts of both the tibia and fibula and to the strong membrane that connects them. The lower attachment is to the heel bone by means of the Achilles tendon, which is shared with the gastrocnemius and plantaris muscles. A small portion of the population has an additional head of soleus muscle immediately behind the Achilles tendon in the space ordinarily occupied by a pad of fat. This extra muscle can be quite large and is easily mistaken for a tumor (Travell and Simons 1992).

Soleus attachments to the heel bone make it a primary plantar flexor of the ankle; this means it allows you to push down strongly with the front of your foot. Soleus muscles are very active during walking, running, cycling, jumping, and climbing, which are the activities that are most likely to promote trigger points in the soleus. Myofascial trigger points in poorly conditioned soleus muscles are the cause of the heel pain so common among weekend athletes. But people other than athletes very frequently have trouble with soleus muscles, as one man, who hadn’t jumped or run in thirty years, could testify.

Jeffrey, age fifty, lived in a pleasant neighborhood near his job. He enjoyed the walk to and from work, but he began to have sharp pain in his heels and had to resort to taking his car to work. The backs of his heels were extremely sensitive to touch, so much so that he had to hang his feet over the edge of the bed at night. At a medical clinic, he was told that bone spurs were the cause of his pain and that surgery was the only solution. Massage to

move the skin of your calf with your knee instead of sliding over it.

If the opposite knee technique is not comfortable, try sitting on the floor, a couch, or a bed with a tennis, lacrosse, or 60 mm high bounce ball and a couple of thick books (figure 10.28). The books lift the leg up for additional leverage against the ball. With your arms at your sides, lift your pelvis off the floor and move your whole leg to massage the ball deeply into the calf. If you are unable to lift your body to move the leg, simply position the ball and let gravity do the work. Some folks also like using the ball against a wall. Be aware that there are major nerves and blood vessels deep in the back of the calf. If you have problems with your circulatory or nervous systems, it is best to avoid deep

Treatment Tips

Massage the lower leg against the opposite knee for treatment any time of day. Be sure to support your leg and lower back by clasping your hands around your knee.

Use a ball (tennis ball size) on a stack of thick books to massage any of the calf muscles. A 60 mm rubber high bounce ball is ideal because it won’t slip.

While standing, place your foot on a chair to massage using a stick-type tool.

Jeffrey's soleus muscles in his calves ended his heel pain. Subsequently, when the pain occasionally tried to come back while he was out walking, self-applied massage enabled him to get rid of it within minutes.

Here's an example of a different type of heel pain:

Juanita, age forty-three, worked as a bookkeeper at a popular local bakery. During the season leading up to the area's largest sporting event, she worked long hours on the production line baking pies. Over time, she developed intense pain in her heels. It felt as if she had bruised her heel on a stone. It was especially bad in the mornings or after being immobile for a period of time. Her massage therapist found trigger points in every muscle of her calves, but especially in the soleus. The treatment helped immediately, but it took Juanita's participation in her own healing to completely solve the problem. Self-applied massage before and after work in addition to short treatment sessions during breaks kept Juanita on her job and progressing in her recovery.

Symptoms

Pain from soleus trigger points is referred primarily to the heel, calf, and back of the ankle (figures 10.29 and 10.30). Surprisingly, soleus trigger points can cause deep pain in the sacroiliac area and maintain spasms in the muscles of the low back (figure 10.31). Hypersensitivity to touch in the low back can sometimes be traced to soleus muscles. There are even instances of pain having been referred to the jaw (not shown). When this happens, the jaw muscles develop satellite trigger points that keep recurring. A trigger point in the inner edge of the soleus at the back edge of the tibia bone occasionally sends pain to the medial malleolus, which is the knob on the inner ankle (figure 10.32) (Travell and Simons 1992).

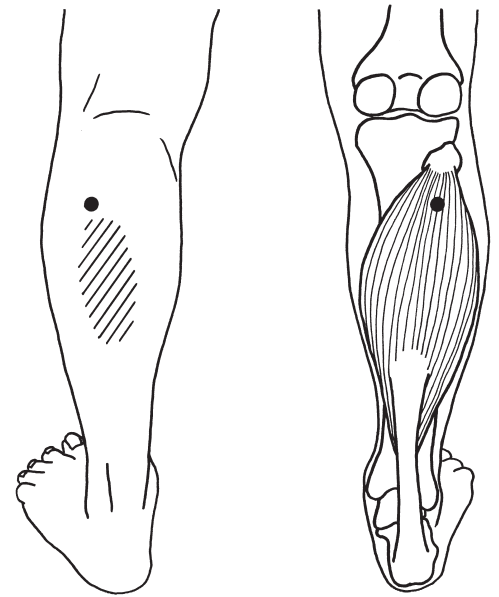


Figure 10.29 Soleus number 1 trigger point and referred pain pattern

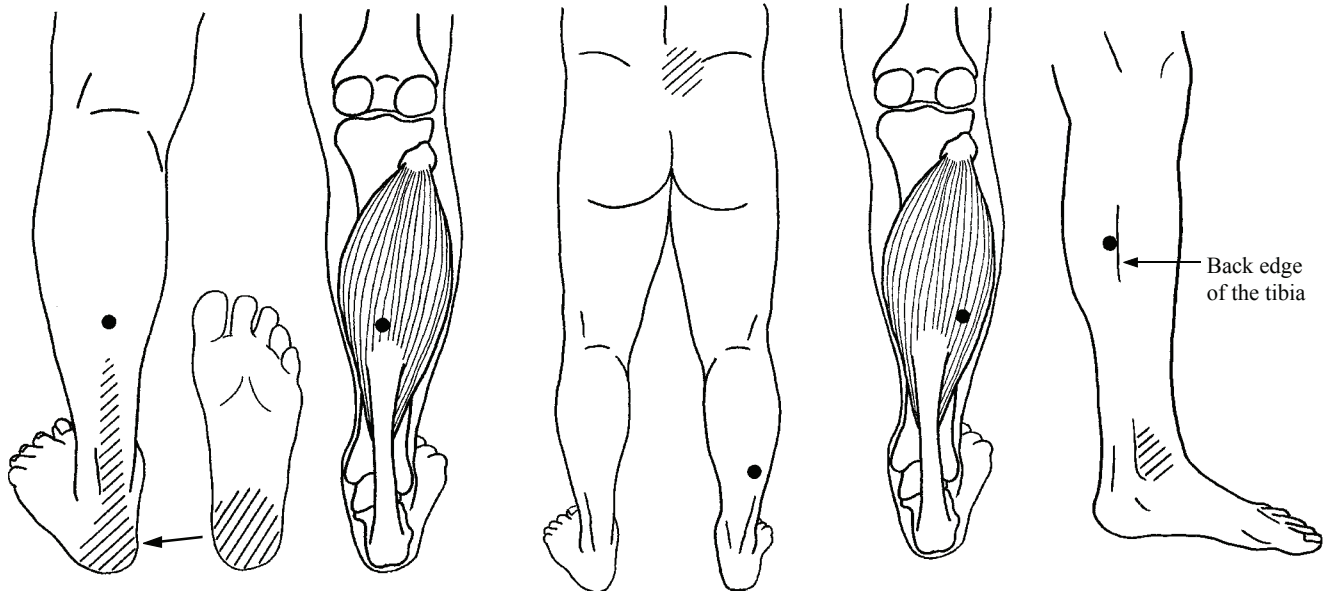


Figure 10.30 Soleus number 2 trigger point and referred pain pattern. This medial point is just to the big toe side of the leg below the bulgy gastrocnemius.

Figure 10.31 Soleus number 3 trigger point and referred pain pattern. This lateral point is on the little toe side of the midline of the back of the leg below the gastrocnemius. Trigger points in this area can also refer pain to the jaw.

Figure 10.32 Soleus number 4 trigger point and referred pain pattern

Several serious medical problems occur with pain similar to that caused by trigger points in soleus muscles and may cause confusion in diagnosis. Even without redness, swelling, and inflammation, possible misdiagnoses include thrombosis, phlebitis, stress fractures, and tendon or ligament tears (see “A Word of Caution” at the beginning of the Calf Muscles section). Myofascial pain can also be mistaken for shin splints or heel spurs. Heel spurs may actually be present and yet not be the cause of pain (Travell and Simons 1992).

Achilles tendinitis is the typical diagnosis for pain in the backs of the ankles. “Plantar fasciitis” is a label often given to disabling foot pain. Conventional treatments for tendinitis and plantar fasciitis in the form of painkillers, steroid shots, orthotics, physical therapy, and rest are often disappointing. This is understandable when you consider that none of these treatments would have a significant effect on trigger points. Most heel pain and pain around the Achilles tendon start from tension and trigger points in soleus, tibialis posterior, or quadratus plantae muscles (Travell and Simons 1992).

The soleus muscle is sometimes called the body’s “second heart,” because of its importance in helping pump the blood up from the feet and legs. In their normal functioning, soleus muscles contract when both shortening and lengthening, making them very efficient at pumping blood, just as long as they are active, healthy, and resilient. Myofascial trigger points, however, diminish their efficiency. Low blood pressure and unexpected fainting can be due to weak or poorly functioning soleus muscles (Travell and Simons 1992).

Trigger points in soleus muscles may promote posterior compartment syndrome, which is increased intramuscular pressure that restricts circulation of the blood in the legs. Soleus trigger points can also contribute to the development of varicose veins, phlebitis, and other manifestations of circulatory problems (Travell and Simons 1992).

Causes

Overload of the soleus muscles can come from slipping as you walk or run on sand or gravel. The uncertain footing caused by hard leather soles can strain them. Trouble can come from stiff-soled shoes, from pressure on the backs of the legs by an ottoman or a recliner’s footrest, or from skiing or skating without good ankle support. Aerobic dancing is a common cause of soleus exhaustion. You will notice these days that most shoes have a significant heel, even men’s and children’s shoes. Wearing a shoe with a heel higher than the sole keeps the calf muscles shortened, which is a sure way to create and perpetuate trigger points. It is wise to choose shoes that have support and padding but not a tall heel. The ankle instability typically caused by high heels also strains the soleus muscles with each step (Travell and Simons 1992).

Treatment

Locate the soleus muscle by feeling it contract below the lower border of the gastrocnemius when you point your toes. Use the same massage techniques for the soleus muscles as for the gastrocnemius (figures 10.25, 10.26, 10.27, and 10.28). Search out the specific trigger points by using the big bulgy gastrocnemius as a landmark. The upper soleus trigger point is between the two outer gastrocnemius trigger points and quite easy to find. The lower trigger points deserve a little more focus. Notice how the gastrocnemius has a distinct bottom edge to it when you point your toes. The soleus trigger points are below this edge. Now draw an imaginary midline straight down the back of the calf. Using your fingers, find the heel pain trigger point (figure 10.30) just an inch to the inside of this vertical midline. If you don’t find a trigger point here, search down toward the ankle an inch or two more. Notice that the heel pain trigger point is located on the big toe side of the leg. The low back pain trigger point is just an inch to the other side of the vertical midline, still below the bulgy edge of the gastrocnemius (figure 10.31). This trigger point area can also cause an achy pain in the jaw. To resolve persistent achy jaw pain, massage an area about the size of a golf ball at this outer trigger point. See the treatment section under “Gastrocnemius” for lower leg treatment tips.

If you tend to get light-headed when you get up from a seated position, try shifting your weight from foot to foot for a few seconds as soon as you're on your feet, at about the speed of your normal walking rhythm. This gets your soleus blood pumps going and moves oxygen to your brain at a faster rate. After sporting events or exercise, quick recovery of breath and energy can be accomplished by this same means: indeed, after any strong exertion, alternately contracting the calf muscles keeps the blood flowing strongly up from the legs and through the whole system at the very time the tissues need that extra boost. Soldiers standing at attention for long periods have been known to pass out because of the prolonged inactivity in their soleus muscles. When they've had good training, they know how to prevent this by rhythmically contracting and relaxing their calves.

The soleus muscles need exercise to maintain their strength for propelling the body forward and for their duties as blood pumps. At the same time, they should not be abused by overuse or unnecessary strain. A suddenly increased level of activity in the form of a new program of exercise, a spurt of weekend sports activity, or unaccustomed yard work can play havoc with the soleus and other muscles of the calf.

Preventative maintenance is especially important for the calf muscles. A good habit is to take a few moments in the morning to sit on the edge of the bed and massage your calves with your knees.

Tibialis Posterior

The *tibialis* (tib-ee-AL-iss) *posterior* lies deep to the more superficial soleus and gastrocnemius between the tibia and the fibula. It attaches to both bones and to the fibrous interosseous membrane that fastens them together. The muscle's long tendon wraps around the inner side of the heel and goes forward to attach to several bones in the middle of the foot's arch. The function of the tibialis posterior is to invert the foot (turning the bottom of the foot inward) and to help flex the foot downward. Its action also maintains the long arch of the foot and keeps weight properly distributed to the outer side of the foot. Morton's foot syndrome and weakness in the tibialis posterior muscles allow the ankles to bend inward (pronation), flattening the foot and giving the appearance of fallen arches.

Symptoms

Pain from tibialis posterior trigger points concentrates primarily in the Achilles tendon (figure 10.33), especially while you're walking or running. Pain may sometimes extend to the calf, heel, and entire sole of the foot (not shown). Myofascial pain caused by tibialis posterior trigger points can be mistaken for evidence of shin splints, posterior compartment syndrome, and tendinitis. In fact, symptoms attributed to Achilles tendinitis are often nothing more than referred pain from tibialis posterior trigger points (Travell and Simons 1992). If there is a true problem with the Achilles tendon, it helps to massage its three muscles: the gastrocnemius, soleus, and plantaris.

Causes

Walking or running on rough, uneven ground stresses the tibialis posterior. Badly worn shoes or any surface that causes rocking of the foot does the same. Morton's foot, in causing you to walk on the inner edges of the foot, can overwork the tibialis posterior and bring about pain in the back of the ankle (Travell and Simons 1992). This muscle is commonly overused in running. Stretching this muscle is often recommended for runners. Massaging the muscle first will give you a more productive and therapeutic stretch.

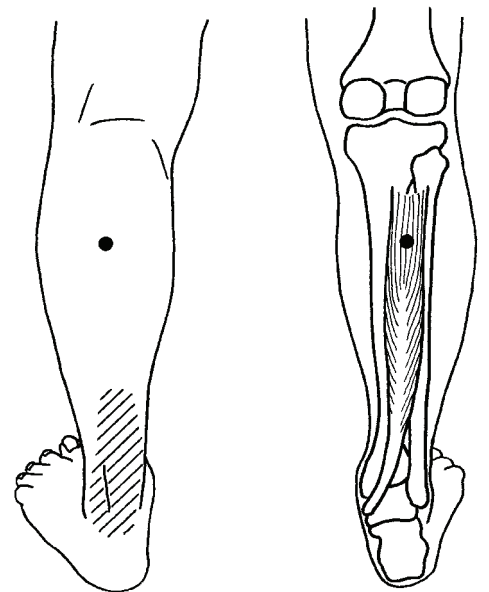


Figure 10.33 Tibialis posterior trigger point and referred pain pattern

Treatment

You won't be able to locate the tibialis posterior muscle by isolated contraction, because all the calf muscles tend to contract at the same time, no matter what movement you make with your foot. To find tibialis posterior trigger points, feel for exquisite tenderness between the two heads of the gastrocnemius. Aim your pressure right into the center of the big bulgy part of your calf. Press into the middle, then up an inch and an inch toward the outside of the leg (figure 10.34). Do the massage with a tool that will go deep, such as the Thera Cane, a Knobble, ball on a book, supported fingers, or two thumbs together. The opposite knee, although it might seem too broad a tool, will also work just fine. The weight of the leg will project the force through the thick overlying muscles. Move your leg slightly across your knee so that the tibialis posterior is repeatedly squeezed against the back of the fibula. Remember that the fibula is the outer bone in the lower leg. See the "Treatment Tips" sidebar above for more treatment details. Be aware that there are major nerves and blood vessels deep in the back of the calf. If you have problems with your circulatory or nervous systems, it is best to avoid deep pressure into the calf.



Figure 10.34 Finding and treating tibialis posterior with fingers

Flexor Digitorum Longus and Flexor Hallucis Longus

The *flexor digitorum* (dih-jih-TAW-rum) *longus* and the *flexor hallucis* (HAL-uh-sis) *longus* are the long flexors of the toes. They are companions to the tibialis posterior and lie with it beneath the larger muscles of the calf—the soleus and gastrocnemius. These long flexors operate in conjunction with the short flexors, which reside in the underside of the foot.

The flexor digitorum longus is located along the back of the tibia, and the flexor hallucis longus is found along the back of the fibula a little lower down. These positions are opposite what you would expect when you see where their tendons attach. The tendons of both muscles wrap around the inner side of the heel and then cross one another, the digitorum going to the four smaller toes and the hallucis to the big toe. This crossed arrangement gives a mechanical advantage to the toes, allowing them to press more powerfully against the ground. The two long toe flexors, along with the short flexors in the bottom of the foot, are important for maintaining balance. They also help propel the body forward.

Symptoms

Trigger points in the long toe flexors make the soles of your feet hurt when you walk. Flexor digitorum longus trigger points send pain to the metatarsal arch and to the undersides of the toes (figure 10.35). The metatarsal arch is the pad of the forefoot formed by the heads of the metatarsals, the five long bones in the front of the foot. Pain from the flexor hallucis longus is felt under the big toe and the head of the adjoining first metatarsal (figure 10.36). Numbness and tingling in the underside of the big toe is a classic symptom of flexor hallucis longus trigger points. Driving may activate this symptom in the right foot.

Pain on the underside of the front of the foot is typically blamed on bad shoes, flat feet, and gout. Few people imagine that it could be coming from

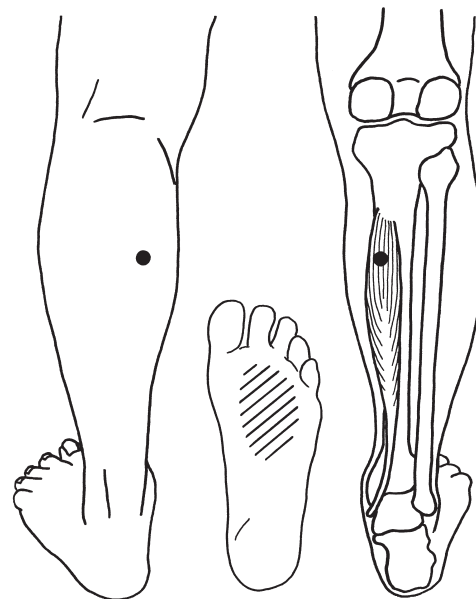


Figure 10.35 Flexor digitorum longus trigger point and referred pain pattern

muscles in the calf. Trigger points in the long toe flexors are also capable of sponsoring cramps in the smaller muscles of the bottoms of the foot and contributing to the development of hammertoe and claw toe, in which the toes stay cramped in distorted positions (Travell and Simons 1992).

Causes

Trigger points in the long toe flexors come about when the toes are worked to the point of exhaustion by the activities of the foot and lower leg. An example is when you run or walk barefoot on soft beach sand or a rocky hillside. Walking on uneven ground behind a lawn mower can be very tiring for the toe flexors. Trigger points in the soleus and gastrocnemius muscles that weaken them can make more work for the long toe flexors. All five muscles of the calf are likely to harbor trigger points when running or walking has been done to excess (Travell and Simon 1992).

Treatment

Flexor digitorum longus trigger points are buried deep beneath the soleus and gastrocnemius muscles right beside those in the tibialis posterior and like them can be massaged with the opposite knee. With the flexor digitorum longus, you will make the knee go in the other direction and repeatedly squeeze the muscle against the tibia. Use your fingers to verify the location. Just like with the tibialis posterior, start by pressing into the very center of the bulgy gastrocnemius. Find the flexor digitorum longus by stroking up an inch and then to the inside about an inch (figure 10.37). Read the “Treatment Tips” sidebar above for advice on how to do the massage ergonomically. Be aware that there are major nerves and blood vessels deep in the back of the calf. If you have problems with your circulatory or nervous systems, it is best to avoid deep pressure into the calf.

Flexor hallucis longus trigger points are a third of the way up from the ankle just below the edge of the gastrocnemius. Point your toes to find the bulgy bottom edge of the gastrocnemius. Then imagine a line straight down the

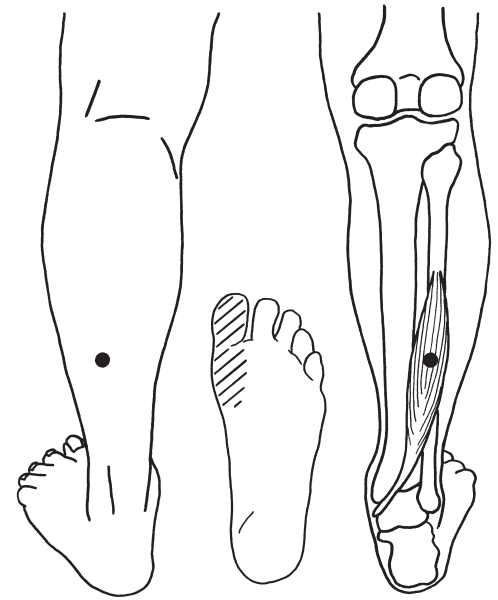


Figure 10.36 Flexor hallucis longus trigger point and referred pain pattern



Figure 10.37 Finding and treating flexor digitorum longus with fingers

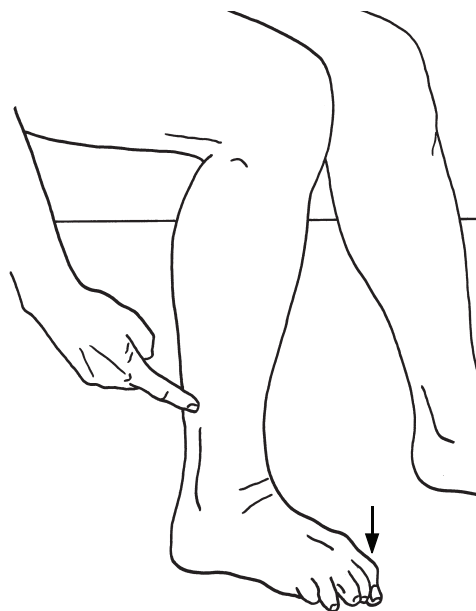


Figure 10.38 Locating flexor hallucis longus by isolated contraction

center of the calf. Press into the midline of the calf below the gastrocnemius then push toward the outer side. Locate the flexor hallucis longus by feeling it contract when you curl your big toe under (figure 10.38). To keep from contracting the overlying soleus at the same time, avoid pushing down with the foot. An easy way to massage the flexor hallucis longus is to press the muscle against the fibula with the opposite knee. This technique is shown in figures 10.26 and 10.27.

Foot Muscles

You probably don't give much thought to your feet until they start to hurt. This is unfortunate, because your feet are literally the foundation for every vertical activity of the body.

Your feet are literally the foundation for every vertical activity of the body.

The feet are extraordinarily complex, each containing nine separate, individually named muscles. Add to this the seven interosseous muscles—the tiny muscles between the long metatarsal bones in the front of the foot. Then there are the four even smaller lumbricals, which are left over from the days when our ancestors' toes were longer and were used for grasping. This makes twenty muscles in each foot, which sounds like a lot of muscles to come to terms with. Fortunately, success in getting rid of foot pain doesn't require being on a first-name basis with every one of them. It does help, however, to understand the nine major foot muscles individually because they all have different pain referral patterns. The interosseous and lumbrical muscles cause only local pain and can be treated as a group. Interestingly, there are only two muscles on the top of the foot. The other seven are on the underside. As mentioned above, the bottom of the foot is called the plantar surface, the word “plantar” coming from another Latin word for “sole.” The word is easy to remember if you think of plantar warts.

Many things besides myofascial trigger points can cause foot pain, including bunions, bursitis, arthritis, plantar warts, calluses, ingrown toenails, infections, gout, broken bones, stress fractures, ligament tears, and certain structural abnormalities like Morton's foot. You may need help with medical and structural problems such as these, but you won't need help with Morton's foot. You can take care of Morton's foot yourself.

Morton's Foot Syndrome and Elevated First Metatarsal

(This section was written in collaboration with Bjorn Svae of www.mortonsfoot.com.)

The metatarsal bones connect the bones of the midfoot to the base of your toes. In an ideally structured foot, the length of the first metatarsal bone should be such that the big and the second toe joints are side by side, sharing the load when you walk. Looking at the top of your feet, you might discover that it looks like the second toe joint is forward of the first toe joint so it looks like your second metatarsal is too long. If you have Morton's foot syndrome (aka Morton's foot or Morton's toe), your second metatarsal is too long relative to the first metatarsal (figure 10.39). (This doesn't necessarily make your second toe longer than your first toe.) A long second metatarsal causes instabilities and inefficiencies in the operation of the foot and ankle that frequently lead to the development of trigger points and chronic pain. The effects of Morton's foot are often manifested in chronic muscle tension and pain even in the upper back, neck, and head. Morton's foot, however, in itself is not painful (Travell and Simons 1992).

One person in four has Morton's foot. The problem caused by a long second metatarsal is poor distribution of the body weight on the bottoms of the feet. For good balance and stability, the foot should contact the ground like a tripod, with the weight evenly spread between the heads of the first and fifth metatarsals and the heel. When the second metatarsal is too long, its head

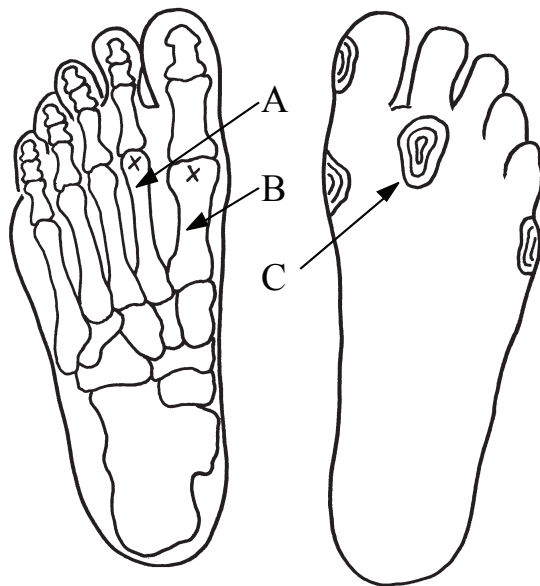


Figure 10.39 Morton's foot: (A) second metatarsal, (B) first metatarsal, (C) calluses

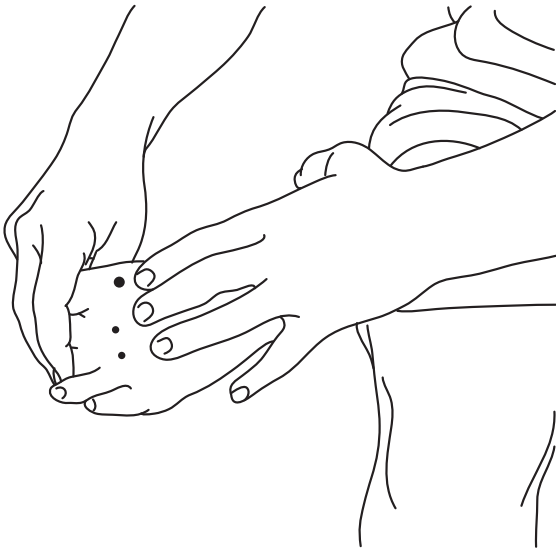


Figure 10.40 Locating the metatarsal heads

contacts the ground first and takes the full weight meant to be shared with the first metatarsal. This gives you a two-point support instead of a three-point support. It's like walking on ice skates: your ankles become unstable, too easily bending in and out. Many people naturally compensate for Morton's foot by turning their feet outward so that more weight is placed onto the first metatarsal. This makes the ankle more stable, but also causes it to lean unnaturally inward (hyperpronation) and places undue strain on numerous muscles, including those of the foot, lower leg, thigh, buttocks, and back.

Figure 10.39 shows the interior of Morton's foot, as well as exterior evidence of the condition. In the skeletal view, the Xs mark the heads of the first and second metatarsals. Note that the length of the second toe may have no relationship to the length of the second metatarsal. You may have a long second toe and a normal metatarsal, or you may have a long metatarsal that doesn't show up in any lengthening of the second toe. In some cases, both may be extra long. You can check your feet for Morton's foot by simply bending your toes down so that you can see the heads of the first two metatarsals and

gauge their relative length (figure 10.40). As you pull down on your toes, push up on the heads of the first three metatarsals from underneath to make them stand out under the skin on the top of the foot. Draw a straight line from the first to the third metatarsal head. If you have Morton's foot, the second metatarsal will be longer than these other two metatarsals.

The other foot illustrated in figure 10.39 shows the positions of four unnaturally heavy calluses typically associated with Morton's Foot. The heaviest one appears right under the head of the second metatarsal. The other three are found along the edge of the big toe and the edges of the heads of the first and fifth metatarsals. Occasionally, the third metatarsal is also long like the second and a callus will form under the heads of both metatarsals. If you get regular pedicures, you may not have enough calluses to judge. Another distinctive sign of Morton's foot is a deeper web between the first and second toes compared to the second, and third toes. Directly gauging the relative length of the first and second metatarsal bones, however, is the best way to tell.

Elevated First Metatarsal

Dr. Dudley Morton, for whom Morton's foot was named, discovered and documented the condition. He also noticed that people who had an abnormally short first metatarsal or a too long second metatarsal also had a hypermobile first metatarsal. He observed that the first metatarsal, instead of bearing weight, would appear to give way and instead transfer weight to the second metatarsal. To avoid that imbalance, the ankle and foot accommodate by hyperpronating or dropping the arch so the elevated big toe bone can touch the ground, creating a three-point support (Morton 1935). The website www.mortonsfoot.com describes what happens when you have an elevated first metatarsal:

Standing or walking at a relaxed pace should not require much effort, and certainly should not cause pain. But when your body is unsure or out of balance, your muscles become tense. Because hyperpronation causes instability and throws your body off balance, the posture muscles from your feet to your neck remain tense all the time. They never get the “relax” signal like when you finish climbing a hill and are back on level ground, or sit down for a rest. Hyperpronation causes your arches to collapse and your ankles to roll in when you shift weight to your forefoot. Two things visibly happen because of hyperpronation. First, your

posture changes—your legs rotate inward, your hips rotate forward (one more than the other) and your whole upper body and head rotate and drift forward. Second, because this “head forward” posture creates muscle tension and spasms, your body subconsciously tries to compensate for it. Medical professionals call this “Common Compensation Patterns.” Unfortunately, over time, this typically deforms your posture further, causing even more muscle strain and pain (www.mortonsfoot.com).

In addition to checking to see if you have Morton’s foot, you can also benefit from doing this quick test to see if you have an elevated first metatarsal causing hyperpronation of the foot.

Self-Test for Elevated First Metatarsal

Follow these steps to test yourself. It simulates what happens when you are walking or running. You can see a video of this test at www.mortonsfoot.com.

1. Stand on a hard surface with your feet comfortably apart, toes straight forward and feet parallel.
2. Lean slightly forward and bend your knees so that your hips drop eight to ten inches straight down. Keep your back vertical—don’t squat—and keep your heels on the floor.
3. Force your knees to move straight forward so they are aligned over the middle of your feet (third toes).
4. From this position, move your knees slowly toward each other until you feel weight-bearing pressure under the first metatarsals (balls of your feet behind your big toes). The pressure should be even under the entire surface of your feet.
5. If you have to move your knees inward to make the inside of your feet weight bearing, you have elevated first metatarsals.

Many people turn their feet out and lean their ankles in to make the first metatarsal weight bearing. There is another common pattern people use to compensate for the elevated first metatarsal. It manifests in a subconscious shift of weight bearing to the outside of the feet. This helps the feet point more forward and reduces knee and back pain, but it also overworks the calf muscles leading to continuous muscle soreness and cramps, including shin splints. Often these people have high arches and supinate (or turn the bottom of the foot inward) when weight bearing.

There is a company that makes relatively inexpensive insoles and toe pads especially for Morton’s foot syndrome. You can find them online at www.mortonsfoot.com. They have a money-back guarantee, and their experienced customer service representatives can help you determine the amount of correction you need.

If you are not yet ready to spring for a new set of insoles, try out the solution with this easy do-it-yourself method. Build up the first metatarsal by placing a thin pad under the head of it, a point sometimes called the “ball of the foot.” Cut a circle the size of a quarter to a half dollar (depending on the size of your feet) out of Dr. Scholl’s Moleskin Plus Padding. You’ll need a pad for each foot. Keep the pads in place by sticking them on the bottoms of a pair of plain foam Dr. Scholl’s

insoles or similar brand flat insoles (figure 10.41). Take care that the pads don’t extend under the second metatarsals. You may need a couple of layers of Moleskin Plus Padding, but in most cases not more than one-quarter inch. The remedy for the elevated first metatarsal is the same as is often used for Morton’s foot, except the amount of correction; the thickness of the pad placed underneath the first metatarsal relates to how much the first metatarsals are elevated.

Mortonsfoot.com makes the following recommendation to determine the size of the insole needed if you have an elevated first metatarsal: Do the knee bend test above again. Watch your knees as you adjust your feet to bear the weight equally from left to right and front to back. Notice how

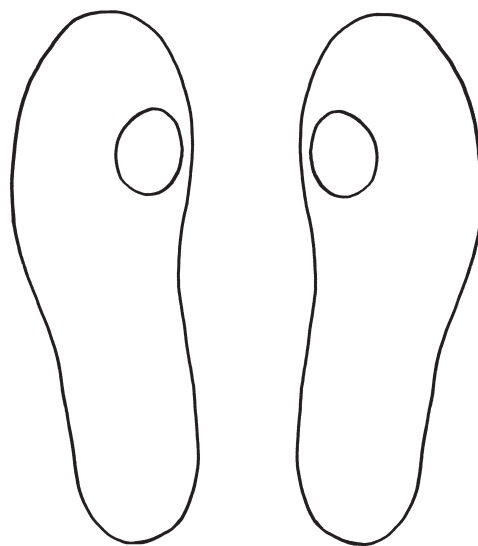


Figure 10.41 Pads under the first metatarsal heads

the knees have to move medially (toward each other) for the feet to shift weight to the first metatarsals. If the midline of your kneecaps move up to the big toe but not over it, a 3.5 mm angled insole is sufficient. If the middle of the kneecap passes over the big toe, or past it, they recommend a 6 mm angled pad underneath your first metatarsals. The small 3.5 or 6.0 mm wedge activates muscles bringing the first metatarsal to the ground so it may become weight bearing and prevent the foot from overpronating. This also eliminates the supinating compensation pattern and the need to turn the feet outward to gain stability.

Morton's foot and an elevated first metatarsal are not problems that you should ignore. You'll be astounded at the difference the correction will make. Proper function of the foot returns immediately, postural dysfunction improves, and pain all over the body becomes much easier to resolve.

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Dorsal Foot Muscles

The dorsal foot muscles are found on the top of the foot (figure 10.42). The interosseous muscles, which occupy the spaces between the metatarsal bones, are also thought of as dorsal muscles, because they're most easily approached from the top of the foot (not shown). Treatment of the dorsal and interosseous muscles is quite straightforward. Pain from their trigger points is generally local and is not referred away to any other site. Diabetes makes the foot less sensitive. Be cautious when treating any part of the foot.

Extensor Digitorum Brevis, Extensor Hallucis Brevis, and Interosseous Muscles

The *extensor digitorum* (dih-jih-TAW-rum) *brevis* and *extensor hallucis* (HAL-uh-sis) *brevis* are short toe extensors. They lie beneath the tendons of the long toe extensors on the top of the foot. Both short and long extensors work together in raising the toes so they can clear the ground with every step you take.

There are actually two sets of *interosseous* (in-tur-AW-see-us) muscles between the metatarsal bones of the foot: the *dorsal interosseous* and the *plantar interosseous*. A third set of small muscles, the *lumbricals* (LUHM-bri-kulz), are parallel to the metatarsals on the bottom side of the foot but aren't between them. The interosseous muscles move the toes from side to side and help with flexion and extension. This confusing mass of tiny muscles may seem annoyingly insignificant, but they contribute mightily to balance and to adaptation of the foot to the ground. Their actions are also vital for countering excesses in the actions of the larger but less sensitive muscles of the foot.

Symptoms

Pain from trigger points in the short extensors occurs right around the muscles, which are located on the outer side of the top of the foot (figure 10.42). In the illustration, the *extensor digitorum brevis* is made up of the three heads of muscle

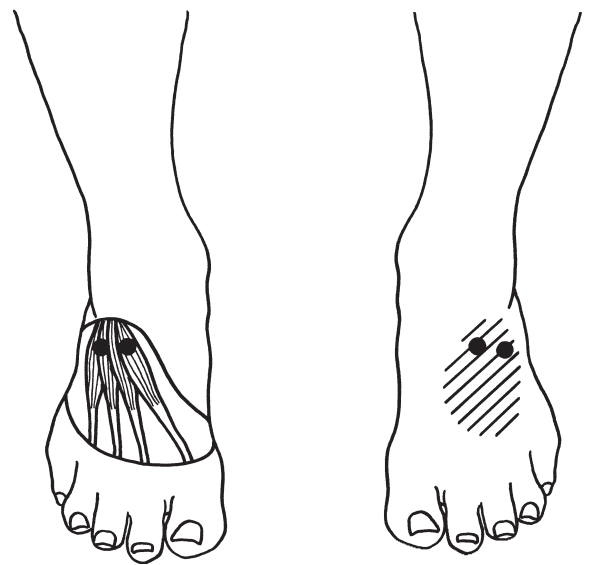


Figure 10.42 Extensor digitorum brevis and extensor hallucis brevis trigger points and referred pain pattern

attaching to the smaller toes. The extensor hallucis brevis is the single muscle leading to the big toe. Their combined pain pattern overlaps that of the long toe extensors, the tibialis anterior, and the peroneus tertius. It's sometimes necessary to troubleshoot all these muscles to find the trigger points that cause the pain.

Pain from the interosseous trigger points is felt at the base of the toes, often extending to the ends of the toes (figure 10.43). Pain may occasionally cover the entire front of the foot and move up the front of the shin (not shown). Trigger points in the interosseous muscles often cause cramping and swelling of the front of the foot. A dull aching in the top of the foot may come from any of the dorsal foot muscles. Trigger points in the first dorsal interosseous can make the big toe tingle. Numbness rather than pain can be present in any of the referral areas (Travell and Simons 1992).

Causes

Walking, running, or climbing can set up trigger points in any of the extensor and interosseous muscles. It's not unusual for all of them to be involved, since each depends on the others for proper functioning in the foot's delicately balanced system of operation.

Be wary of shoes that are too tight across the front of the foot. Tightness there restricts circulation and movement and encourages problems with the interosseous and short toe extensor muscles. To favor these much-abused muscles, it would be a good idea to put your high-heeled shoes away. They cause your feet to slide down into the toes of your shoes, crowding the muscles in the front of the foot. At the other extreme, going without shoes, if you're not used to it, can also put unaccustomed strain on the muscles of the foot.

Treatment

Locate the extensor digitorum brevis and extensor hallucis brevis by feeling them contract when you raise your toes (figure 10.44). Use only the tips of the fingers or the supported thumb to massage the dorsal foot muscles. They're generally small and thin and don't require a lot of pressure.

To massage the interosseous muscles, dig the tips of two fingers or a supported thumb in between the metatarsals from either above or below (figure 10.45). Two other methods for interosseous massage are shown in

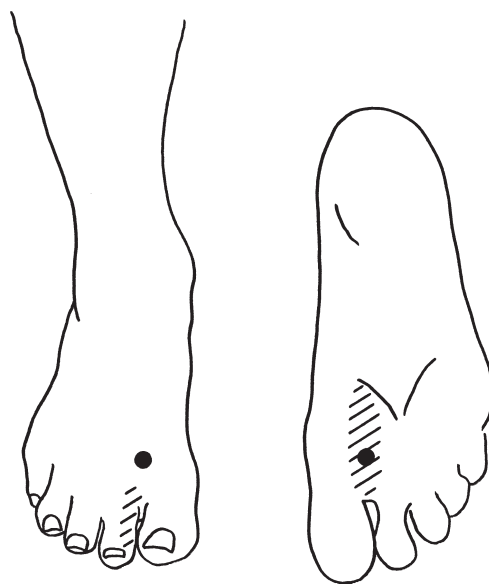


Figure 10.43 Sample interosseous trigger point and referred pain pattern. These muscles lie between each metatarsal.

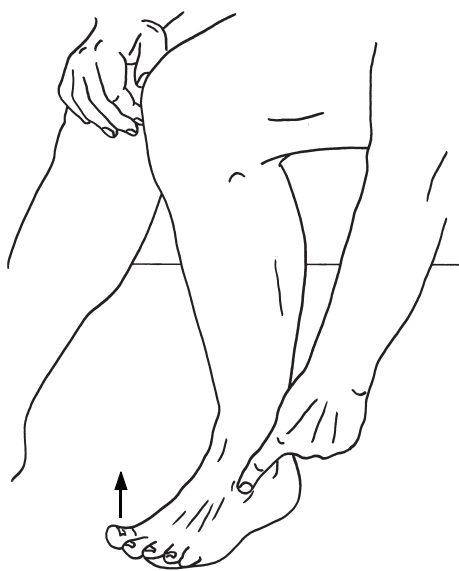


Figure 10.44 Locating the short toe extensors by isolated contraction

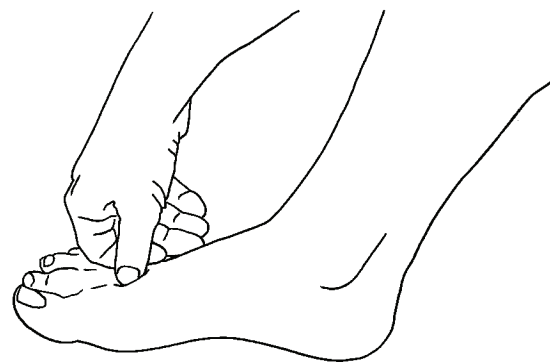


Figure 10.45 Interosseous massage with supported thumb. Treat between each metatarsal.

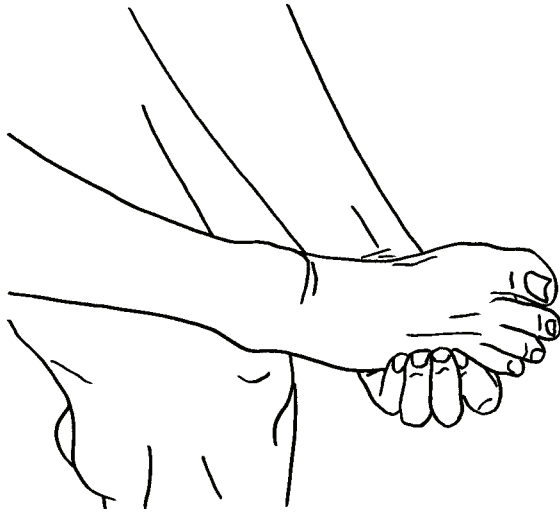


Figure 10.46 Interosseous massage with fingers wrapped around the foot (from either side)

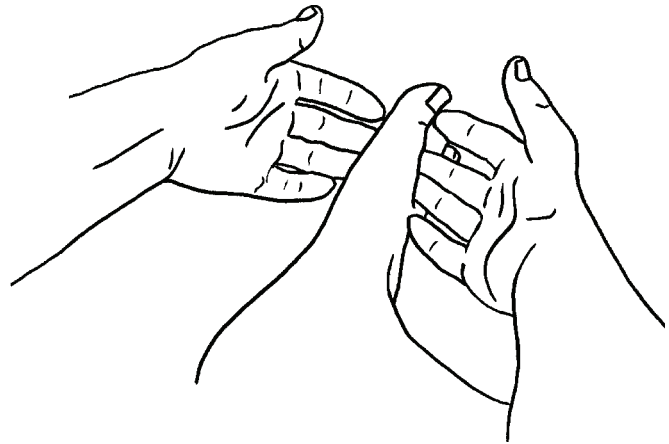


Figure 10.47 Interosseous massage from both sides, working the dorsal and plantar interosseous muscles at the same time

figures 10.46 and 10.47. Using an eraser clamp tool like that used for the hands (figure 6.49) is also very easy. Press in and then to the left and right to compress the muscles against the metatarsal bones. When interosseous trigger points are bad, this can be excruciatingly painful and can even cause cramping if you massage too vigorously. Go easy at first. Stretching the bottom of the foot in an effort to cope with a cramp in the arch can also set off cramps in the interosseous muscles and in the short extensors in the top of the foot. If you like stretching, massage the muscles first.

Plantar Foot Muscles

Plantar fasciitis is currently a common diagnosis for foot and heel pain. The medical explanation would seem to make sense if you knew nothing about trigger points and myofascial pain. The defining test used in the diagnosis is to press into the arch and see if it hurts. This is where you find the plantar fascia, the thick tendinous tissue that supports the arch. Pain at this spot supposedly indicates that the fascia is inflamed. The problem with this view is that the flexor digitorum brevis and quadratus plantae muscles immediately underlie the plantar fascia, and their trigger points quite naturally hurt when pressed. Self-applied massage to these exquisitely tender spots can dramatically improve even long-standing “plantar fasciitis” in just a few days. Also, remember that, when dealing with bottom-of-the-foot pain, calf muscles are usually the primary cause. Diabetes makes the foot less sensitive. Be cautious when treating any part of the foot.

A good foot rub can feel really great and yet do absolutely nothing to get rid of chronic foot pain. If you want to massage your feet effectively, it's essential to try to visualize and understand what's inside. There are seven muscles in the bottom, or plantar surface, of the foot. Each muscle has a specific job to do and causes its own special kind of pain when afflicted with trigger points. The following case histories show some of the many ways people can experience problems with the plantar foot muscles.

Remember that, when dealing with bottom-of-the-foot pain, calf muscles are usually the primary cause.

Cliff, age twenty-eight, was an assistant manager in a supermarket and was on his feet with hardly a break all day long. It didn't help a bit to stop and rest. The bottoms of his feet hurt even when he was sitting down. Betty, his boss, showed him how to massage his feet by rolling them across a little rubber ball. It hurt so bad the first time he tried it that he didn't think he'd be able to stand it. But he kept the ball in his

pocket and worked on his feet whenever he had a chance. A couple of days later when Betty asked how his feet were doing, he suddenly realized they didn't hurt anymore.

Raymond, age seventy-seven, often had cramps in the bottoms of his feet and his toes were numb most of the time. The doctor thought the numbness might come from the chemotherapy Ray had had for lymphoma. His daughter had been reading about trigger points and began rubbing his feet whenever she came to visit, which she did two or three times a week. Some of the places on the bottoms of his feet hurt terribly when she rubbed them, but she tried to use only the pressure he could stand. After a few weeks, Ray noticed that he rarely got cramps anymore and that the numbness in his toes was almost gone.

Abductor Hallucis

The *abductor hallucis* (ab-DUK-ter HAL-uh-sis) is one of several muscles that move the big toe. It lies along the inner edge of the bottom of the foot near the heel, attaching to the heel and to one of the bones of the big toe. Its job is to move it away from the other toes and bend the big toe downward. This action contributes to propulsion and helps keep the foot and ankle from rocking inward. The workload of the abductor hallucis is increased when trigger points in other muscles of the lower leg and foot make the ankles weak and unstable. Instability caused by Morton's foot also puts an extra load on the abductor hallucis.

Trigger points in the abductor hallucis cause pain primarily on the inner side of the heel and a short way up the inner ankle (figure 10.48). When trigger points are active enough,

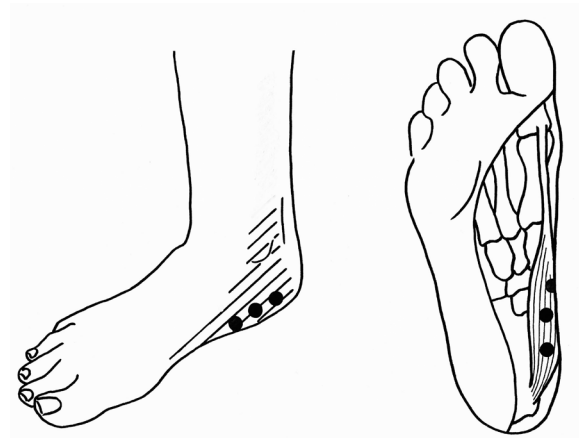


Figure 10.48 Abductor hallucis trigger points and referred pain pattern

Treatment Tips

A common child's toy may be the best tool you can find for massaging the bottoms of the feet. A 35 mm rubber high bounce ball is about the size of a quarter and widely available in gum-ball dispensers.

To massage your feet, sit down, take off your shoes, and roll the ball between your foot and the floor. Work slowly, searching for exquisitely tender trigger points. Tilt your foot to massage along the edges of your foot, especially back by the heel for the abductor muscles and beside the big toe for the flexor hallucis brevis. If the 35 mm rubber ball is too intense, try a larger 45 mm or 60 mm ball. A racket ball may even be useful at first.

pain is felt under the first metatarsal (not shown). Abductor hallucis trigger points occasionally cause nerve entrapment, resulting in numbness in the foot and toes (Travell and Simons 1992).

Locate the abductor hallucis at the inner edge of the heel by feeling it contract when you press the big toe against the floor. The abductor hallucis is very easy to get to, but it can be a thick muscle and you'll

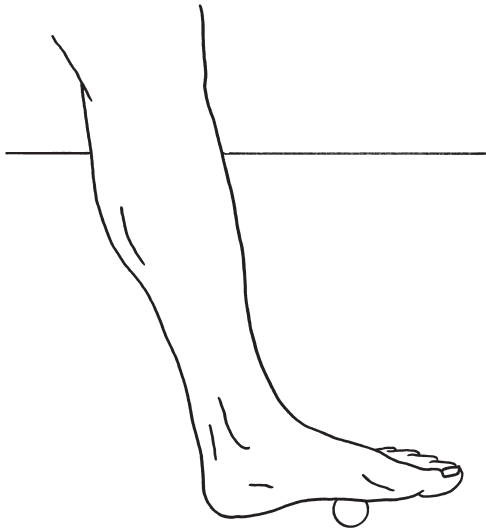


Figure 10.49 Massaging the bottom of the foot with a 35 mm high bounce ball on the floor

points are especially tender, start with a larger 45 mm high bounce ball or even a tennis ball on the floor.

When one of the muscles on the bottom of the foot is in trouble, they're all bound to be in trouble. Just remember that if the muscles were healthy, pressure on them wouldn't hurt at all. Lighten up to the point where the pressure feels therapeutic. Trigger point massage should "hurt good." It should induce a pleasant kind of pain.

Abductor Digiti Minimi

Digiti minimi means "little digit or toe." The function of the *abductor digiti minimi* (ab-DUK-ter DIH-jih-tee MIH-nih-me) is to move the little toe away from the other toes. This action (abduction) helps control side-to-side rocking of the foot when the body is in motion. Because of its importance, the abductor digiti minimi can be a relatively large muscle. Walking or running on rough, uneven ground makes hard work for toe abductors and promotes trigger points. High-heeled shoes and shoes or sandals with stiff, inflexible soles are bad for them, too.

Trigger points in the abductor digiti minimi cause pain primarily in the muscle itself along the outer edge of the foot near the heel and sometimes a short way up the outer side of the ankle (figure 10.51). This pain can sometimes feel like a sprain. When sufficiently active, trigger points will also cause pain in the little toe and under the head of the fifth metatarsal right behind the toe (not shown) (Travell and Simons 1992).

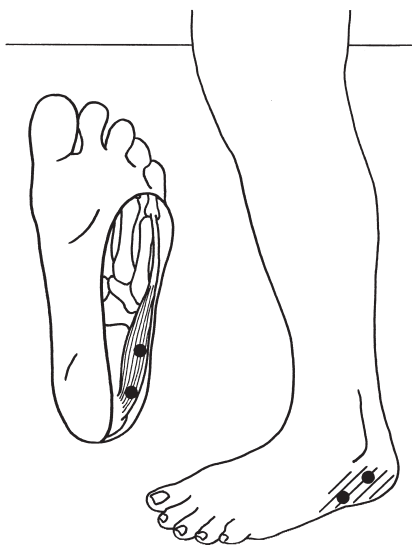


Figure 10.51 Abductor digiti minimi trigger points and referred pain pattern

need to get some leverage to penetrate it. The best massage tool for this muscle is a 35 mm high bounce ball against the floor (figure 10.49). This ball is about the size of a quarter. While sitting, place your foot on the ball and evert the foot—that is, turn the bottom of the foot outward (figure 10.50)—to put the ball on the inside just in front of the heel. There can be three trigger points: one very much on the side of the foot and another two on the edge of it. See "Treatment Tips" (immediately above) for more information. A golf ball is the traditional tool for working the bottom of the foot, but it is a little less effective because it's larger. It's also slick and a little too hard. Any small ball will work, but the high bounce ball is the best. You may be able to find one in a gum-ball machine at the grocery store. If your trigger



Figure 10.50 Position for massaging the inside edge (medial side) of the foot with a 35 mm high bounce ball

Locate the abductor digiti minimi by feeling it tighten when you spread your toes. Massage the muscle with a 35 mm high bounce ball on the floor. You may find the worst trigger point just above the edge of the sole on the outer side of the heel. Roll the bottom of your foot inward (inversion) to put the ball on the outer edge of the foot (figure 10.52). Move the ball toward the heel.



Figure 10.52 Position for massaging the outside edge (lateral side) of the foot with a 35 mm high bounce ball

Flexor Digitorum Brevis

The *flexor digitorum brevis* (FLEX-or dih-jih-TAW-rum BREH-vis) attaches to the heel bone and the toe bones and lies squarely in the middle of the long arch. The flexor digitorum brevis assists the flexor digitorum longus of the calf in plantar flexing the four smaller toes (curling them under). Trigger points in both muscles send pain to the front of the foot under the heads of the metatarsals just behind the toes (figure 10.53). This pain can be like walking on sharp

rocks and is one of the most common manifestations of “sore feet” (Travell and Simons 1992).

Arch supports or other orthotic devices are often used to treat pain in the sole of the foot in the mistaken assumption that it’s being caused by weak or fallen arches. When the pressure from arch supports increases the pain under the front of your foot, look for trigger points in the flexor digitorum brevis (Travell and Simons 1992).

In trying to fix sore arches, it’s natural to massage the arch itself, but don’t forget that most pain in the long arch actually comes from trigger points in the gastrocnemius muscle in the calf. Although the flexor digitorum brevis occupies the arch, it does not cause pain in the arch.

Locate the flexor digitorum brevis by feeling it contract when you curl your toes under. Use a small 35 mm high bounce ball on the floor to massage this muscle (figure 10.49).

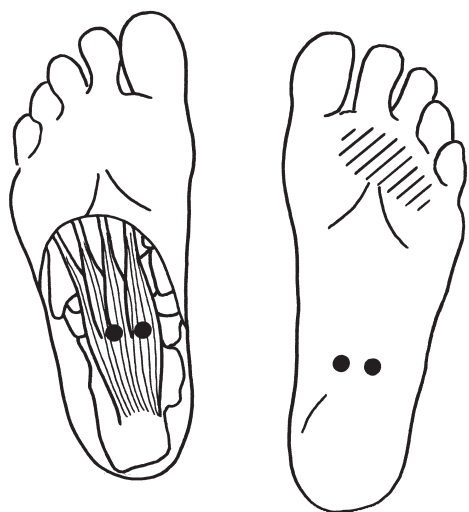


Figure 10.53 Flexor digitorum brevis trigger points and referred pain pattern

Quadratus Plantae

The *quadratus plantae* (quad-DRAY-tus PLAN-tee) attaches to the heel bone near the attachment for the flexor digitorum brevis. At its other end, it attaches to the tendons of the flexor digitorum longus, allowing it to assist with flexion of the toes. This action gives the quadratus plantae its alternate name, *flexor accessorius*. This important and often troublesome muscle lies very deep in the foot just in front of the heel and is completely hidden by the flexor digitorum brevis.

Quadratus plantae trigger points cause sharp pain in the heel that feels like you’ve bruised it stepping on a stone (figure 10.54). When you step down, it can feel like a nail is being driven in. Sometimes it’s impossible to put your weight on your heel, leaving you to walk on your toes. The soleus muscle can be a primary source of heel pain. This pain is often misdiagnosed as plantar fasciitis or mistakenly blamed on a heel spur. Heel

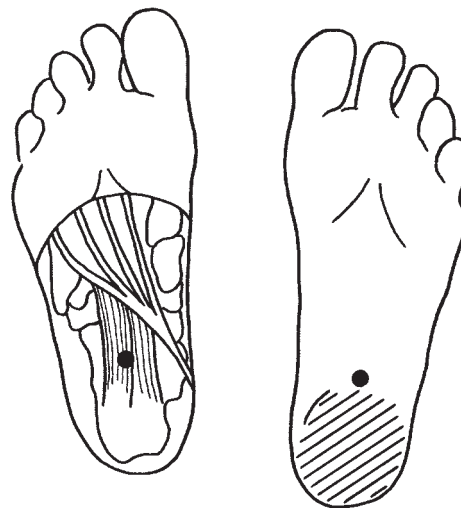


Figure 10.54 Quadratus plantae trigger point and referred pain pattern

spurs can be present and actually not be the cause of the pain: indisputable evidence of the harmlessness of a heel spur is when massage stops the pain. Of course, genuinely painful heel spurs and myofascial trigger points can coexist (Travell and Simons 1992).

It's not possible to locate the quadratus plantae by isolated contraction because it contracts together with the flexor digitorum brevis, which overlies it. The trigger points for both muscles are very close together. The quadratus points are a bit closer to the heel and much deeper. In fact, you won't be able to go deep enough with your fingers or thumb to massage the quadratus plantae. To get to it while sitting, you will need a small 35 mm high bounce or rubber ball (if this feels too intense, start with a slightly larger ball).

Adductor Hallucis and Flexor Hallucis Brevis

It helps to keep trying to remember what all these Latin words mean. *Hallucis* is the big toe. An *adductor* pulls the bone toward the midline. A *flexor* bends the joint reducing its angle. *Brevis* means "short."

These two muscles are difficult to distinguish from one another by isolated contraction, since they contract at the same time when you push down with the big toe. They do have different pain patterns, however. Trigger points in the *adductor hallucis* (ad-DUK-ter HAL-uh-sis) cause pain under the heads of the metatarsals just behind the four smaller toes (figure 10.55). Sometimes they cause numbness in the same area. Pain from *flexor hallucis brevis* (FLEX-er HAL-uh-sis BREH-vis) trigger points appear under the head of the first metatarsal (the ball of the foot) and on the inner side of the foot near the big toe (figure 10.56).

Trigger points in the adductor hallucis and flexor hallucis brevis are among the most common causes of pain felt in the front of the foot while you're walking. They cause much less pain when you're not on your feet. These muscles of the big toe are overworked when you must compensate for foot imbalance caused by a long second metatarsal. For this reason, chronic pain in the metatarsal arch can often be traced to a Morton's foot syndrome. (The metatarsal arch is formed across the front of the foot by the heads of the metatarsal bones.)

Locate the adductor hallucis and flexor hallucis brevis muscles by feeling them contract when you flex the big toe downward. Slowly search for trigger points in the metatarsal arch and behind the head of the first metatarsal. One of the best tools for massage in this area is a 35 mm high bounce ball against the floor while seated. Some trigger points in these muscles can be quite deep since the muscles themselves are very deeply placed under everything else. You can wear your hands out quite quickly if you try to do much massage with them on the bottoms of the feet. Roll the bottom of the foot to the outside (ever-sion) to get the ball onto the second trigger point in the flexor hallucis brevis (figure 10.50). You will find it on the inside edge of the foot.

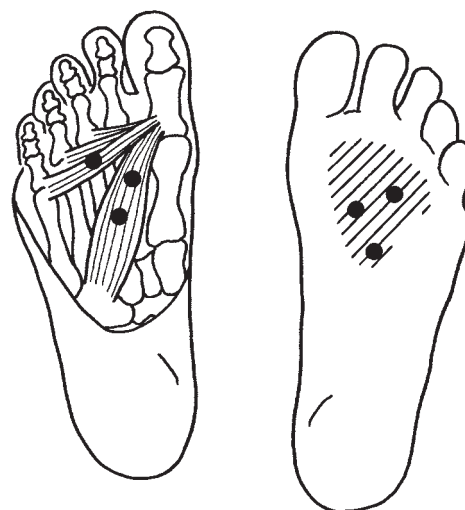


Figure 10.55 Adductor hallucis trigger points and referred pain pattern

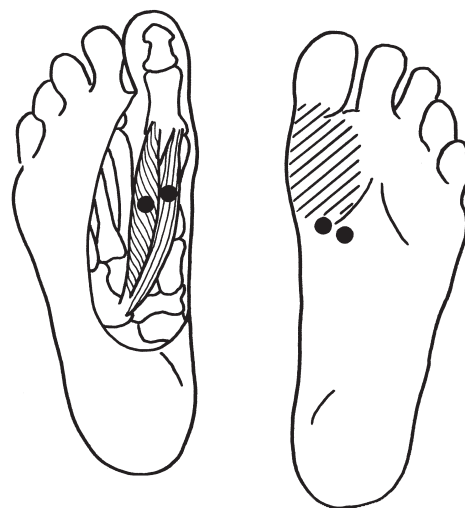


Figure 10.56 Flexor hallucis brevis trigger points and referred pain pattern

Flexor Digiti Minimi Brevis

Flexor digiti minimi brevis (FLEX-ur DIH-jih-tee MIH-nih-mee BREH-vis) means “short flexor of the little toe.” The muscle is actually bigger and stronger than you would think, judging from its association with the little toe.

But it plays a very important role in maintaining balance when you walk, run, or simply shift your weight. Try pushing against the floor with the little toe by itself and feel the muscle contract all along the underside of the fifth metatarsal. This action keeps the ankle from turning too far to the outside when you walk or run. It helps keep your body centered over your feet.

Unstable ankles can overload the flexor digiti minimi brevis muscles. You can also abuse them by carrying heavy objects or just by carrying too much weight of your own. Walking or running on uneven ground puts a strain on the flexor digiti minimi brevis muscles because they have to work so hard to help you keep your balance.

Trigger points in the flexor digiti minimi brevis cause pain at the outer edge of the foot just behind the little toe (figure 10.57). Massage it with a little 35 mm high bounce ball against the floor. Read “Treatment Tips” in the “Abductor Hallucis” section for treatment details.

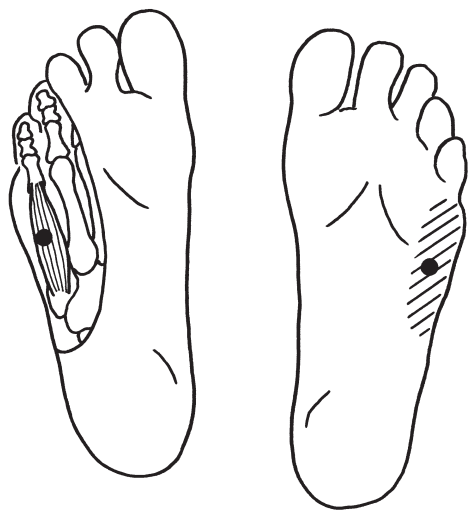


Figure 10.57 Flexor digiti minimi brevis trigger point and referred pain pattern

Chapter 11

Clinical Trigger Point Massage

This chapter is intended primarily for massage therapists, but it can be used as a study guide for anyone who wants to help someone else deal with pain. Those who may find it particularly useful include physicians, physical therapists, occupational therapists, personal and athletic trainers, yoga instructors, nurses, and others in the field of health care. If you are interested in advanced formal training in trigger point therapy, please consult the Resources section in the back of the book.

A Higher Level of Education

In the time since this book was first published in 2001, I have worked with thousands of massage therapists from all over the United States and the world in our Trigger Point Therapy Workshops. The first two and a half years, my father, Clair, and I taught together; later I took over leading the seminars. The workshops cover both self-treatment and clinical treatment techniques. Massage therapists everywhere have said that trigger points were covered only briefly in their massage schools—if at all! Most therapists come to the classes seeking to advance their skills in treating the various pain conditions already being presented in their studios and clinics. They are ready to move from wellness massage to a more clinical approach. This chapter was written as a guide to help those interested in the next level of client care.

There are many paths to excellence in massage therapy. If you stay in this field for any period of time, there are many opportunities to become advanced in one of many modalities or to dabble in a little of this and a little of that. When asked, most massage therapists will describe a blend of modalities uniquely combined to create a holistic experience for their clients. Techniques presented in this chapter can be added into that mosaic of treatment. Ultimately, it is possible to become certified in myofascial trigger point therapy in addition to the other elements you currently use.

Across all fields of health care, trigger point therapy is a missing piece in the treatment of pain. It should be taught to student practitioners in all fields, including medicine. Self-treatment, in particular, should be taught in schools as the foundation for understanding and successfully treating trigger points. When you can find a specific trigger point in your own body, it improves your palpation skills for finding it on another body. Self-treatment also acts to validate the profound effectiveness of trigger point therapy.

New Approach to Therapeutic Massage

Trigger point massage is a practical and versatile approach to pain therapy. As a stand-alone therapy, it can be done anywhere, not necessarily requiring a massage table or massage chair. When need be, it can even be done through clothing. As a purely clinical modality, trigger point massage can be limited to specific problems and specific

muscles. It doesn't require a full-body treatment or a lot of time. Ideally, physicians will become better equipped to recognize pain caused by active trigger points. Then they can refer patients out to trained therapists when longer courses of treatment are needed. Physicians and health insurance companies will surely come to see the cost-saving potential in this.

There are many ways to directly treat a trigger point. The traditional approach is to press and hold a trigger point until it softens and releases. This method, commonly called *ischemic compression*, can easily be overdone, leading to soreness and more pain. It is important to treat each client as an individual, using whatever treatment approach is most effective with the fewest detractors. A great deal of attention needs to be paid to ergonomics in clinical treatment, because of the extraordinary physical demands made on the professional therapist.

The advantage in using a short moving stroke for clients and patients is that their pain problems can be relieved quickly with only a minimal amount of discomfort. The pressure is focused and should feel good or "therapeutically delicious." Trigger point massage can be as pleasant and as deeply relaxing as "feel-good" massage.

A typical session can look like a blend of physical therapy and massage therapy. Often there is a standing postural assessment and range of motion testing before and sometimes during treatment. Clients sometimes wear shorts and for women a tank top is worn for modesty and ease of draping. There is soft lighting and calming music in the background. Swedish massage, myofascial release, joint mobilization, stretching, and other techniques are blended with the specific trigger point massage. At the end of the session, clients are educated in self-applied trigger point massage. Depending on your state's massage licensing law, or if you are qualified as a personal trainer or physical therapist, you can also recommend stretching and strengthening exercises at home.

Clear Communication

When the client seeks relief from a specific pain issue, a little longer intake is required than for a relaxation session. A general health history is always a good idea to identify any underlying conditions or medications that may contraindicate massage. Expect to sit down face-to-face and listen to the client's history and pain problem. Have the client fill out a pictorial pain chart with a red pencil to visually document the areas of pain. It is much easier for clients to describe symptoms in detail before getting on the massage table.

More communication is also needed during a trigger point massage than in a general relaxation massage session. It's important to initiate the conversation and to continue to check in with the client throughout the treatment. Some clients may endure an amazing amount of pain just to avoid hurting your feelings or to "get their money's worth." They may be giving too much credit to the notion of "no pain, no gain." Often, less is more.

Since you cannot literally feel your clients' pain, you must rely on them to tell you when you are on a tender spot. Some therapists have the ability to find trigger point nodules with their fingers. But even those who have this facility can still have difficulty feeling trigger points when they're deep in layers of muscles, or if the muscles are especially tight. When you're within the target area, remind clients that they are welcome to guide you to the most tender spot. Think of the treatment session as a collaborative effort.

There are a multitude of lumps and bumps on every body. Just because you feel a knot doesn't mean that it is a trigger point or that it should be massaged. Even when you are in the location of a trigger point, it is possible to be a millimeter or two off of the point. It is important to communicate quite a lot during the session. Using a pain scale to communicate is especially helpful. The sensation should be a pleasant kind of discomfort that can still be relaxed into. This is defined as a number 5 on a scale of 1 to 10 (1 is no pain; 10 is saying "ouch" and trying to get away). A 5 should be the client's level of "perfect"—this is the place where she doesn't want any more pressure, but she also doesn't want any less. It is a little bit uncomfortable, but she likes it. It is "therapeutically delicious." Sometimes you feel that you are hardly touching her. A few ounces of pressure can be the difference between excruciating and delicious. Often this level can be felt by your fingers as the place where your pressure meets resistance, but not always. It is counterproductive if the client tenses the muscle in defense. Meet the client where she is, even if she can tolerate only feather-light pressure.

It's a good idea to begin with the trapezius muscles when working with a new client. The trapezius almost always has tension, and it acts as a good gauge of the client's overall reaction to pressure and pain. It is useful to continually ask for pain numbers and to watch her body language so you can always interpret what she is feeling. It's not enough to occasionally ask, "How does this feel?" or "How is the pressure?" Answers to such questions tend to be vague and sometimes misleading. Asking for a number on the pain scale will give you a more accurate description. After a couple of sessions, the client will learn what feedback you need and will offer important feedback more readily.

It pays to be conservative with a new client. Many fibromyalgia sufferers respond very well to trigger point massage if done at an individually appropriate level, but it's very easy to overdo it. With fibromyalgia syndrome, it's better to risk undertreating. Limit the time spent working trigger points to no more than thirty minutes during the first couple of sessions.

Learn Trigger Point Therapy on Your Own Body First

The best way to learn the location and sensation of each trigger point is to find it on your own body. When you have mastered self-treatment of trigger points, you will have gained a fundamental understanding about them that you can't get any other way. Most people have latent trigger points. You even may be living with old injuries or chronic pain that you've given up on finding a solution for. Try finding all the trigger points that could be contributing to the problem. What have you got to lose? You may be in for a surprise when those old pains disappear. It has happened hundreds of times in workshops. The ability to self-treat active trigger points daily can make all of the difference in many conditions. Additionally, self-care is critical for the professional therapist. Overuse injuries are common in our field. If you learn nothing else from this workbook, master self-treatment of your forearms and hands. Doing so is truly golden.

Assessment

In addition to a health history form, it's wise to have the client fill out a pictorial pain chart. A new pain chart is filled out at each session. Use a form containing simple line drawings of the whole body. The client uses a red pencil to color the places where pain is felt. These charts are used by the therapist for note taking and tracking progress.

Master self-treatment of your forearms and hands. Doing so is truly golden.

Clients never tell you everything in the first interview. Predictably, they forget to tell about some of their lesser pain problems. They may consider some of their symptoms too trivial or unimportant to share. But everything ties together, and small clues can be important in tracking down the source of major symptoms. Keep asking questions. Inquire about pain in other areas.

Probe their memories for information on falls, auto accidents, and habitual activities that may contribute to the problem.

Clinical Massage Guidelines

Here are some suggested guidelines for trigger point massage:

1. Learn trigger point therapy on your own body first.
2. Use assessment and range of motion testing.
3. Identify perpetuating factors.
4. Warm the tissue and search for trigger points.
5. Specifically treat the trigger point with a short repeated stroke.
6. Teach your clients self-applied trigger point massage.
7. Gently lengthen the muscle.
8. Strengthen the long overstretched muscles. (Review "The Victims Cry, the Perpetrators Don't" on antagonist trigger points in chapter 2 for more information.)

Study your client's posture and movement patterns. Do a standing postural assessment and watch him walk. If you didn't have the opportunity to master this complex topic in school, there are many continuing education resources available. Thomas Myers has an especially good DVD on postural assessment called "Body Reading 101" from his *Anatomy Trains Myofascial Meridians* series. This DVD can be found online at www.anatomytrains.com. Check the client's range of motion in pertinent joints. James Waslaski's book *Clinical Massage Therapy: A Structural Approach to Pain Management* includes range of motion guidelines, an excellent pelvic stabilization protocol, and techniques for pain-free release of adhesive joint capsules. C. M. Shiflett and Richard Finn created a useful set of range of motion wall charts you can find at www.roundearth.stores.yahoo.net.

Identify Perpetuating Factors

The next step to solving the problem is to identify any underlying perpetuating factors. This is where the fun really begins. Perhaps your client has a leg-length inequality, small hemi-pelvis, or short upper arms. No matter how great your techniques are, if your client walks around on a short leg, her problems will always recur. The same thing is true if she habitually leans to the right to rest her elbow on the armrest. Morton's foot syndrome and the elevated first metatarsal both create problems that start in the foot and reverberate throughout the entire body. You can read about those conditions in chapter 10. Observe the client's state of general tension. Determine whether she is a chest breather, which can be a critical factor in creating and perpetuating trigger points in any of the auxiliary breathing muscles, such as the serratus anterior, sternocleidomastoid, and scalenes. Maybe her nutrition isn't what it could be, or she drinks large amounts of caffeinated beverages. It could be that she needs more opportunities to take breaks at the computer. Some of these factors are out of our scope of practice, but we can educate a client by recommending reading materials and suggesting that she visit a doctor, nutritionist, or other practitioner. For your own knowledge, I recommend reading Travell and Simons's *Myofascial Pain and Dysfunction*. It contains a wealth of information on perpetuating factors, range of motion tests, and stretching protocols. The pictures alone are worth the price. Chapter 2, All about Trigger Points, is a good introduction.

You can learn structural assessment protocols through neuromuscular massage training courses such as Precision Neuromuscular at www.nmtmidwest.com, Judith Walker DeLany's Neuromuscular Therapy Training Center at www.nmtcenter.com, or Paul St. John's seminars at www.neurosomaticeducators.com. Or master Travell's entire protocol by becoming a certified myofascial trigger point therapist through Sharon Sauer and Mary Biancalana's courses at www.myopain.com or Stew Wild and Katie Adams' 360 Neuro Muscular Therapy at www.360nmt.com.

Use Warming and Searching Strokes

Massage therapists everywhere recognize *effleurage*, or "flowing" strokes. These are good beginning strokes for calming and connecting with the client, and for bringing circulation to the tissue. Effleurage can also be used to artfully conceal palpation of bony landmarks. Myofascial release techniques can be used before moving on to trigger point therapy. To search for trigger points, use a stroke up to about three inches long confined to the target area, or the "ballpark," in the belly of the muscle fiber. Be aware of fiber arrangement in a given muscle. Fibers don't always run the length of a muscle from attachment to attachment. Unipennate and bipennate muscles have multiple bellies, as do muscles like the rectus abdominis that are divided into sections. Trigger points aren't found just anywhere in a muscle, so it's not necessary to search everywhere. The illustrations will get you in the ballpark, most of the time near the center of the muscle fibers. Search a

Treatment Tips

To treat the trigger point, put the muscle into neutral or even into a slightly shortened position.

After warming the tissue and softening the fascia, do ten to twelve short strokes along the grain of the muscle from one side of the trigger point to the other.

Then repeat the general effleurage strokes. Return to the deep stroking massage for another series of strokes if needed to soften the trigger point. Then move on to the next trigger point or muscle.

baseball-sized area, feeling for increased resistance in the tissue. Sometimes you will be able to feel the trigger point nodule. Usually, the taut band of muscle fibers associated with the trigger point will feel like a guitar string and will be quite obvious. Search the taut band for the most tender area, always asking for client feedback.

Treat the Trigger Point with a Short, Repeated Stroke

There are many ideas on how best to treat a trigger point manually. You can press and hold a point until you feel it soften, until the taut band twitches and lets go, or until the client experiences a reduction in the referral pain. Some therapists use a short, rapid vibration stroke directly on muscle fibers containing the point. Another technique has the client slightly contract the muscle while the therapist holds the trigger point, or, conversely, the therapist puts the muscle on a passive stretch while holding the point.

All the techniques described above have their uses, and all will get the job done. The one that will save your hands and relax the trigger point is a moving stroke much like the one described in chapter 3, Treatment Guidelines. This is a very short stroke that goes from one side of the trigger point to the other. Often the stroke is less than an inch and sometimes only one-quarter of an inch long. This repeated stroke acts as a pump that flushes out the chemicals that sustain the trigger point. Massaging across the trigger point with a rolling pin action may cause a microstretch of the shortened muscle fiber. Lightening up on the pressure between strokes rather than pressing and holding allows fresh blood and oxygen to flood the area.

After initiating warming effleurage strokes to a specific area, focus in on the trigger points. To treat the trigger point, put the muscle into neutral or even into a slightly shortened position. After warming the tissue and softening the fascia, do ten to twelve short strokes along the grain of the muscle from one side of the trigger point to the other. Relax the hands between strokes. Then repeat the general effleurage strokes. Return to the deep stroking massage for another series of strokes if needed to soften and release the trigger point. Then move on to the next trigger point or muscle.

Many therapists prefer the moving stroke because it is easier on their hands. Think of all of the money you have invested in your hands, including your education, work experience, equipment, office space, and much more. It is important to save your hands in every way that you can. As a rule, position your fingers on their tips, thus using their ends to make a sharper tool, instead of using the flats of the fingers, which make a dull tool and tire the hands very quickly (figures 3.3, 3.5, and 3.6). When the tool penetrates easily, it calls for less effort. Always be aware of ergonomics, using body weight instead of muscle to apply pressure wherever possible.

Always be aware of ergonomics, using body weight instead of muscle to apply pressure wherever possible.

The moving stroke is just as effective as pressing and holding and is less likely to bruise the tissue. Think about that for a minute. If you get too enthusiastic seeking to make a stubborn trigger point release, you are likely to beat up the area, which makes a secondary problem for the body to deal with. It is better to start the process in motion by improving the circulation, then get out of the way and let the body do the healing. We can only initiate the process; the body does the true healing. There are some clients who respond better to and/or prefer the press-and-hold method. Some people are blessed with trigger points that melt away quickly with a moderate amount of pressure. Strive to find the balance between what is best for both your client and you.

Generally, the idea is to go with the grain of the muscle in the direction you want the muscle to go. For example, if the hamstrings are short and tight, massage toward the buttocks with both myofascial release and trigger point massage strokes. Conversely, if the hamstrings are long and overstretched, as you would see if the client had anterior pelvic tilt (inclination), then the strokes would be toward the knee. If the client has circulation problems or edema, those conditions clearly take precedence over the needs of the muscle and fascia. The general idea is to improve the circulation locally at the trigger point and encourage the muscle to move in the direction you want it to go.

Teach Your Clients Self-Applied Trigger Point Massage

Most people cannot afford the time or money to come for treatment as often as they need. The effects of sitting all day at a computer cannot possibly be erased by even a weekly one-hour massage. It is valuable to be able to self-treat chronic and recurring trigger points daily. Until all of the perpetuating factors are resolved, the trigger points may return. I highly recommend teaching your clients self-applied trigger point massage and supplying them with or selling them the self-treatment tools. Self-treatment will help them get better faster, validate your work, and secure a loyal customer. It may sound like a contradiction to teach your clients your best techniques, but in reality you will find that your business will grow with referrals and repeat customers. People will recognize that you are in business to help others, not just to make money. Be sure to double-check your state licensing laws to make sure you stay within the perimeters of the massage therapy statute.

Gently Lengthen the Muscle

The traditional approach to trigger point therapy teaches that stretching must take place after deactivating the trigger point. No matter how convincing this argument is, there always seems to be some clients who are not ready for stretching. It is important to be conservative with new clients. Have the client do three repetitions of the full range of motion of the muscle or joint after treatment. Sometimes it is best to wait until the second or third session to initiate gentle lengthening of the muscle. If the client is proficient in yoga or does lots of stretching, he is more likely to respond well to stretching as therapy. If the client lives a largely sedentary life, an overly aggressive stretch may worsen the problem. It is a dance, and there is not one right answer that fits everyone.

Proprioceptive neuromuscular facilitation (PNF), or contract-relax stretching, is very beneficial after deactivating trigger points. When PNF is used with active isolated stretching (AIS), the result is a very powerful combination of techniques. Read the “Stretching” section in chapter 3. It is important to remember that stretching should feel good, comfortable, and pain free.

Not all muscles need to be relaxed with massage and lengthened with stretching. To restore balance, you cannot apply therapy equally to both front and back or even side to side. If you work everything equally, you effectively support the imbalance.

It is also important to identify which muscles are short and tight due to habitual posture, movements, injuries, and stress. Not all muscles need to be relaxed with massage and lengthened with stretching. Someone with a forward-head posture and protracted shoulders does not need her rhomboids and lower trapezius stretched. To restore balance, you cannot apply

therapy equally to both front and back or even side to side. If you work everything equally, you effectively support the imbalance.

Strengthen the Long Overstretched Muscles

Most of us walk around with a forward-head posture, rounded shoulders, and anterior pelvic tilts from a lifetime of sitting. It is important to massage and lengthen the short muscles on the front of the body, but then it is just as important to strengthen the muscles on the back of the body that have been existing in a chronically overstretched position. This will help to keep us upright out of a life of flexion addiction. For most massage therapists, recommending exercises may be out of their scope of practice depending on their training and state licensing regulations. However, collaborating with a personal trainer can be very beneficial for many clients. An even better idea is to go the extra mile and become a certified personal trainer yourself.

Reasonable Expectations

It may be possible to treat most of the trigger points diagrammed in this book in a seventy-five-minute full-body massage. Each point will receive only a few strokes, but the result is a deeply relaxing and effective treatment. This fits nicely into a general Swedish massage. However, free yourself from the idea that you have to do a full-body treatment each time. When clients primarily seek relief for a specific pain problem or two, take your time and focus on solving those problems. Identify what your client wants out of the session before it begins. Make a plan and communicate it to your client.

After a well-executed trigger point massage, you can expect the client to get off the table feeling better. Sometimes the improvement is quite profound after a single treatment and the primary pain problem may be gone entirely. More often, of course, multiple treatments will be needed to completely remove the problem. It is common for the areas that received massage to be a little sore to the touch for a couple of days. Pain with motion is not okay, though. When treatment is successful, symptoms may not return for several days or weeks. They may not come back at all. If possible, call your clients the next day to see how they are doing.

When Massage Is Unsuccessful

Negative outcomes can include increased pain, all-over soreness and fatigue, new symptoms, bruising, or increased stiffness and decreased range of motion. Sometimes the client reacts favorably to the level of pressure during the session, but begins to feel worse over the next twenty-four hours. This may indicate that you used too much pressure, worked a trigger point too long, or worked the entire body too long. Taking pain medicine before a treatment will also reduce the client's ability to feel the treatment fully. Be sure to undertreat clients who are on pain medicine.

It's very important to keep in mind that the main reason for a failure of trigger point massage is that you've simply treated the wrong spots or have missed a primary trigger point somewhere. It's easy to get caught up in treating satellite trigger points and overlook primary trigger points that have created the satellites in the first place. In this case, the primary trigger point will reactivate the satellites, sometimes rather quickly, and there may seem to be no improvement. Symptoms may return in full force within minutes or hours.

Be sure to undertreat clients who are on pain medicine.

When massage seems to have failed, it may not be your fault. The client may be involved in an ongoing activity that is unusually taxing or requires repetitive motion. Working with the client to identify and resolve perpetuating factors is critical in solving the problem. Remember that chest breathing, nervous tension, and poor posture are significant factors in perpetuating trigger points, as are structural abnormalities such as a short leg or Morton's foot (see chapters 2 and 10).

If clients complain that massage didn't help or made their pain worse, you may have used stretching too soon or too aggressively. The safe approach is to leave stretching until you have deactivated all the trigger points. Even then, overly ambitious stretching can reactivate trigger points. Sometimes it takes a few treatments to see results. That is where teaching clients self-treatment really pays off. More treatment = more improvement. Daily self-treatment can really make a big difference.

When You Make a Trigger Point Worse

Too much massage can irritate a trigger point and make it worse. Overtreatment may even cause a muscle to spasm. Do a few strokes of calming effleurage and then leave the muscle alone for a period of time and work on other areas. If you choose to come back to the troublesome area later in the session, be gentle and cautious, as if you were massaging a baby. Icing an overstimulated muscle for ten to fifteen minutes at the end of the session will

calm the pain down significantly. It is important to know that in the worst-case scenario, without intervention, an offended trigger point will be worse only for a couple of days. Then it will either be significantly better or go back to its previous level of discomfort. Some clients may need more superficial work with the fascia before trigger point therapy can be tolerated or effective. Positional release techniques can also be useful on extremely sensitive tissues. Less is often more. Leon Chaitow's book *Positional Release Techniques* is an excellent resource for any manual therapist. The two-volume set *Clinical Application of Neuromuscular Techniques* by Leon Chaitow and Judith Walker DeLany are excellent texts for therapists interested in a truly clinical approach to pain treatment.

Desensitizing the central nervous system is proving to be extremely useful in approaching all forms of pain. Calming down the nervous system with energetic and light touch therapies may be an important first step with many clients. See my website www.triggerpointbook.com for more information and discussion of this topic.

Less is
often more.

Treating the Client Supine

Some massage therapists still primarily work with the client facedown, concentrating on the posterior body. So often we therapists start our clients facedown with the good intentions of getting to the anterior neck, chest, abdomen, and hip flexors, but somehow time gets away. When this practice of concentrating on the symptom areas continues, the front of the body never gets adequately treated. The front of the body is where many habitual postural patterns begin. I would like to propose starting in supine position as often as possible.

Establishing Communication

In any position, the trapezius muscle is a good place to begin because nearly everybody carries some tension and trigger points in this muscle. Use the trapezius as a gauge by which to measure the appropriate level of pressure for each client. Take the time to introduce and describe the pain scale. Since pain is subjective and based on previous experiences of pain, put a limit on the scale. Call a 10 the place where they are saying "OUCH!" and trying to get away. Give them details to use to measure the sensation they are feeling. For example, while a 5 is "perfect" for a client, she will hold her breath and squint her eyes at a 6. At a 7, she will grimace, and an 8 will cause her to think *Oh, my gosh, this hurts* a 9 will evoke swear words, and at a 10, she will try to get away. A 10 is not the most intense pain the client has ever felt because we aren't even going there. Strive to work at a 5 or less on each trigger point. Lighten up when searching a new area and then slowly increase the pressure.

Superficial Front Line

Tom Myers (2001) introduced the concept of connected lines of fascia, which he termed "anatomy trains." I won't attempt here to reproduce his work, but I highly recommend studying his books or taking his courses. For more information, see www.anatomytrains.com. Profound results can be had simply by paying attention to the observation that a sedentary lifestyle often leads to short, tight anterior body muscles and fascia. The superficial front line is a nearly continuous line of fascia running from the top of the foot, up the leg, abdomen, and sternum, and around the sternocleidomastoid muscle to the back of the head. Simply applying myofascial release techniques along with trigger point massage to this line can significantly reduce the tension on the long, overstretched posterior body soft tissue. Often the long, overstretched muscles will develop trigger points as a defense mechanism. You will commonly see this in the rhomboids, infraspinatus, spinal erectors, hamstrings, and calf muscles. To loosen the superficial front line, start at the top of the feet and work your way up the body and then down the back. Clearly, this won't be the right answer for every person you treat. To make informed choices about treatment, be sure to

analyze the posture and range of motion for each of your clients (Myers 2001). If you are unsure about detailed postural assessment, take one or several of the many great continuing education courses available and/or purchase Tom Myers's "Body Reading 101" DVD set.

Dorsal Foot and Shin Muscles

Begin with the dorsal foot muscles on the top of the foot. Trigger points are not common here, but loosen the fascia anyway. Moving up the leg, the tibialis anterior is right next to the tibia. The extensor digitorum longus is only about a finger's width farther to the outer side of the leg. Massage trigger points in the tibialis anterior and extensor digitorum longus muscles with supported thumbs about a hand's width below the knee (figure 11.1). Remember, it is the client's approximate hand size you use to measure with. There may be more than one trigger point along the three- or four-inch length of each muscle's belly. Trigger points in the extensor hallucis longus may be found about a third of the way up from the ankle, roughly straight down from the extensor digitorum longus.

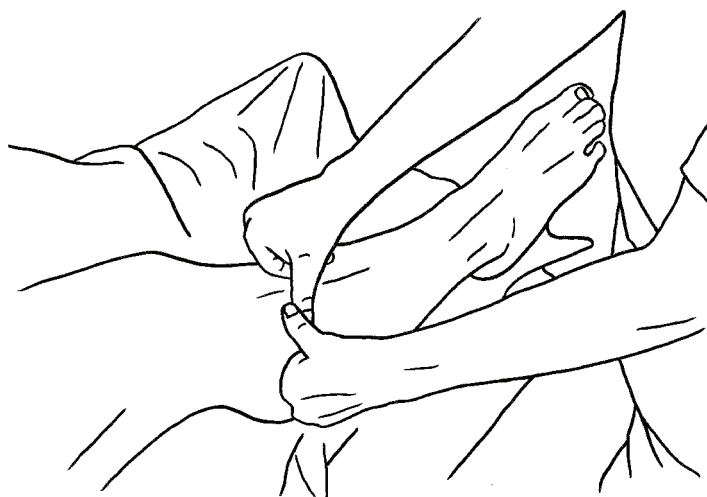


Figure 11.1 Tibialis anterior massage with paired supported thumbs, a hand's width down from the knee, immediately beside the shinbone

Peroneus (Fibularis) Muscles

Treat trigger points overlying the fibula in the peroneus longus about a hand's width down from the knee with a supported thumb or the large knuckles of a loose, open fist (figure 11.2). Stabilize the leg with your opposite hand. Use the same tool for the peroneus brevis trigger points, also overlying the fibula, about a third of the way up from the ankle. Use a supported thumb to search for peroneus tertius trigger points just in front of the fibula, two to four inches up from the lateral malleolus (not shown).

Quadriceps, Sartorius, and Tensor Fasciae Latae

After warming the quadriceps, search for tensor fasciae latae trigger points just below and an inch lateral of the anterior superior iliac spine (ASIS, or the front of the hip bone). To be certain of the muscle's location, have the client rotate the knee inward several times in isolated contraction. For treatment, use paired, supported thumbs or supported fingers (not shown). A second trigger point may be found another half an inch lateral. The same tools can be used for the upper trigger point in the rectus femoris, just below the inguinal crease or slightly less than a hand's width

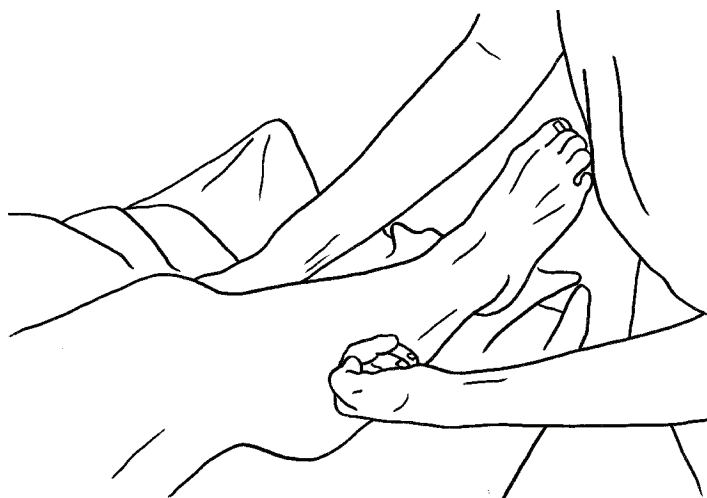


Figure 11.2 Peroneus longus massage with the big knuckles of an open fist, palm up. Support the leg with the opposite hand.



Figure 11.3 Vastus medialis: The edge of the left hand is on the skin and moves the fingertips of the right hand. Move the skin with the tool.



Figure 11.4 Vastus lateralis massage with the knuckles of an open fist, palm up, stroking toward the hip. Support the thigh at the knee.

down from the ASIS. To verify the location of the rectus femoris, have the client slightly lift the leg repeatedly with a straight knee. Find the easy way, using supported fingers, supported knuckles, or paired supported thumbs, to massage trigger points in the vastus intermedius, vastus medialis, and sartorius muscles (figure 11.3). The vastus intermedius trigger point lies deep to the rectus femoris muscle. Measure a hand's length down from the ASIS, then push the rectus femoris slightly medially and press the vastus intermedius against the bone. The vastus

medialis is fairly easy to find medial on the thigh. Measure a hand's width up from the kneecap for the low trigger point and then a hand's length up for the superior point. Trigger points in the sartorius can occur all along the muscle. To feel the sartorius contract, have the client lift the straightened leg and laterally rotate at the same time. If the client has *genu valgus*, or knock knees, the sartorius will be overstretched, causing the trigger points to return frequently.

Search for multiple trigger points in the vastus lateralis, from the knee to the greater trochanter, with a loose, open fist with the palm up (figure 11.4). To keep the leg from rolling away, support it at the knee with the opposite hand. Find the lowest four trigger points a couple of inches up from the knee. They will be just in front of and then just behind the iliotibial band (ITB). If you are not using the side-lying position, it may be necessary to massage in both supine and prone positions since the very broad vastus lateralis wraps all the way around the side of the thigh. Tightness and pain in the vastus lateralis caused by trigger points may be misinterpreted as being in the iliotibial band. Tension in the iliotibial band comes from shortening of gluteus maximus and tensor fasciae latae muscles.

Inner Thigh Muscles

Drape the thigh with the sheet securely wrapped underneath the leg. To locate the adductor longus, place one hand on the client's inner knee and the other hand high on the inner thigh (not shown). The adductor longus will contract prominently against your hand if you have the client adduct the leg. Differentiate the adductor longus and the more posterior adductor magnus by feeling for the narrow trough between them. It may be helpful to think of the adductor magnus as a fourth hamstring. It's very close to being on the back of the thigh.

The adductor longus trigger points are quite high on the inner thigh. Massage the trigger points in the adductors with a side-to-side stroke with supported fingers (figure 11.5). This side-to-side stroke feels less invasive than stroking up and down the inner thigh. The gracilis and adductor magnus trigger points can also be massaged by

grasping and kneading them between the fingers and thumb. The upper adductor magnus trigger point just below the ischial tuberosity can be treated less invasively in the prone position or by self-treatment. It can be more comfortable for the client to massage the inner thigh in a side-lying position with the top leg bent at the knee and placed forward of the thigh being treated (not shown).

The pectineus muscle is located medial of the rectus femoris. Look out for the femoral artery here. Move off the pulse if palpated. This very specific trigger point can be pressed down into the femur just below the inguinal crease. If massage in this area feels too uncomfortable to either you or the client, self-treatment may be better.



Figure 11.5 Inner thigh massage with supported fingers stroking from side to side, not toward the groin

Abdominal Muscles

To have a better understanding of abdominal trigger point locations, it's helpful to separate the muscles into four groups.

Upper abdominals. The first stroke will be along the attachments of the abdominal oblique and rectus abdominis muscles on the lowest three ribs. Start by standing at the client's left side to work in a clockwise direction. (Note that in figure 11.6, the therapist is on the right side of the body.) Reach across the client's body and pull slowly toward yourself with the searching stroke, using paired hands. The next stroke will be just below the lowest rib (figure 11.6). Press the tissue up against the underside of the rib all the way across to the center. When you encounter a trigger point, switch to the very short treatment stroke with supported fingers and give it ten to twelve repetitions (figure 11.7). Take care to avoid the xiphoid process, but make sure to look for the rectus abdominis trigger point just an inch to either side.



Figure 11.6 Abdominal obliques massage with paired hands cross-body



Figure 11.7 Rectus abdominis massage: The supporting hand moves the fingertips of the tool hand. Avoid the xiphoid process.

Midabdominals. The same cross-body strokes are used in the midsection. Remember that the obliques wrap all the way around the side. Grasp and knead the muscles on the side between the ribs and pelvis. Trigger points may be found anywhere in the midabdominals. Keep in mind that the rectus abdominis is divided into eight to ten sections, each with its own muscle belly.

Lower abdominals. Use the same searching stroke, beginning all the way across at the edge of the quadratus lumborum. Pull toward the center, following the top of the hip bone around to the inguinal ligament and then on across to the midline, pressing the muscle down against the top of the pubic bone. There can be multiple trigger points along this path. Since the pubic area remains draped, you may want the client to touch the pubic bone to identify its location. To ease potential embarrassment, therapy can actually be done with the client's hand as the massage tool or by teaching the client how to self-treat. Trigger points can also be found on the anterior aspect of the pubic bone on either side of the midline. These trigger points can feel like little bruises when pressed against the bone, so go easy.



Figure 11.8 Psoas massage with paired hands. Aim for the spine, avoiding the descending aorta on the left side. The client's knees fall away to and are supported on the opposite side.

Psoas and iliacus. Put the client in the same position as illustrated for self-treatment in figure 7.31. The client's bent knees should fall to the side away from you onto a pillow or bolster (figure 11.8). This should tilt the pelvis and raise the near hip slightly off the table. This helps move the intestines out of the way to the opposite side. If this causes the client discomfort, have him return to a neutral position for treatment. Once in position, take a moment to get centered. Have the client take a slow, deep breath, and you do the same.

Find the midpoint between the hip bone (ASIS) and the belly button. Use paired hands with the fingers nearly vertical to sink very slowly into the belly, aiming toward the spine (figure 11.8). The psoas muscle is almost parallel to the spine, and it may feel like it's just under the skin in this position. As you work, watch the client's face for indications that you're using too much pressure. Be aware that you may elicit a pain response before actually coming in contact with the psoas. Use short, very gentle cross-fiber strokes to locate the firm, sausage-like roundness of the muscle. If you can't find this rounded firmness, the psoas on that side may not have trigger points that are active enough to make the muscle tight and firm. Search for exquisitely tender spots, up and down the muscle, from slightly above the belly button and all the way down to the inguinal ligament. To massage the iliacus, press the muscle against the hollow of the front of the pelvis medial of the ASIS.

It may be even more sensitive than the psoas. Finish the abdominal

treatment with several long, circling strokes, following the colon in a clockwise manner.

In treating the left psoas, be alert for the heavy pulse of the descending aorta under your fingers. If you feel the pulse, move your fingers away from the midline just enough to get off of it. You may have to angle in behind the aorta to get to the psoas. If it seems that the pulse is everywhere in the midline, remove your hands and refer the client to her primary care physician. An aortic aneurysm may be present.

Pectoral Muscles

Myofascial release can be especially beneficial in the pectoral area before trigger point therapy. Use supported fingers to find and treat trigger points in the pectoralis major, sternalis, subclavius, and pectoralis minor (not shown). The pectoral muscles can be addressed through the sheet, if necessary. Pectoralis minor trigger points can



Figure 11.9 Pectoralis minor massage with supported thumb under the lateral border of the pectoralis major

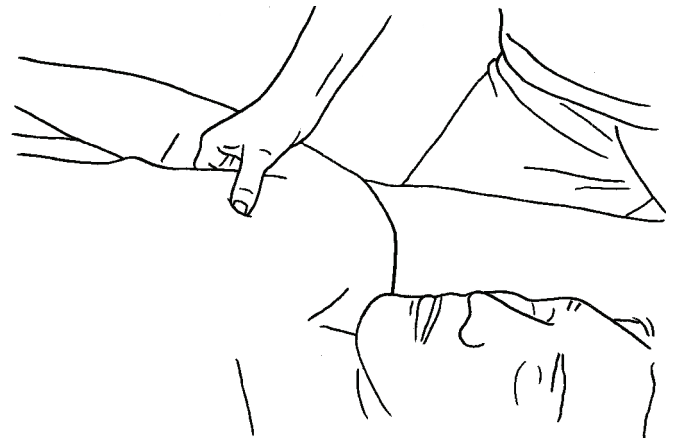


Figure 11.10 Pectoralis major (lateral border) massage by kneading between fingers and thumb

be treated directly through the pectoralis major. Another approach is to use a supported thumb under the outer edge of the pectoralis major to press the pectoralis minor obliquely against the ribs (figure 11.9). Raising the arm can help clear the way. Trigger points in the outer border of the pectoralis major can be kneaded between your fingers and thumb (figure 11.10). Study the location of the many trigger points on your own body.

Subscapularis and Serratus Posterior Superior

To avoid abrading the client's skin, use plenty of lotion in the armpit and make sure your fingernails are very short. Place the client's hand on his opposite shoulder to move the shoulder blade laterally on the back. The client should use his other hand to press the elbow gently down against the chest (figure 11.11). This creates a larger space for your treatment hand. If this position is painful, modify it to keep the client comfortable.

Stand at the client's elbow, facing the head of the table. Reach under his shoulder with your hand that is closest to the head, curl your fingertips around the medial border of the scapula, and pull it toward you. With your hand or both hands in this position, you can massage the serratus posterior superior just medial to the superior angle of the scapula. Massage this muscle first to avoid communication issues. Leaving the hand closest to his head under the shoulder blade, slide your other hand into his armpit with your palm toward you. In the correct position, your fingers will be in the slot between the scapula and the chest wall, and the ends of your fingers will be touching the subscapularis muscle. The backs

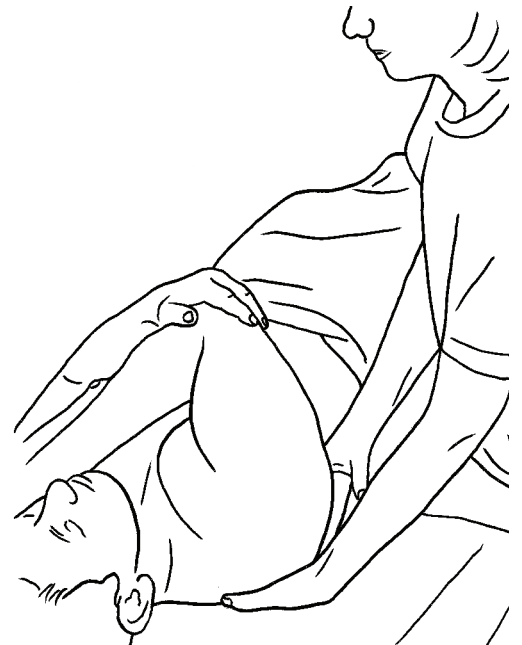


Figure 11.11 Subscapularis massage with the ends of the fingers stroking down into the table and laterally toward the therapist. Start with the backs of the nails tight against the ribs.

of your nails should be against the client's ribs. Exert pressure down toward the hand that is underneath the scapula (figure 11.12). Proceed slowly and with caution. Even light pressure on active subscapularis trigger points can be quite intolerable. Keep asking for numbers on the level of pain.

Two directions are possible for the treatment stroke. You can stroke with the fibers of the muscle down toward the inferior angle, or you can stroke in a very short, cross-fiber scooping motion toward yourself. When you use the cross-fiber stroke, you can readily feel the tendon-like tautness of the muscle. Work your way up toward the head of the humerus where the subscapularis attaches, and then down to the inferior angle of the scapula. Although treatment would ordinarily call for ten to twelve strokes for each trigger point, it's wise to use fewer strokes with the subscapularis. Strive to undertreat it the first couple of sessions. It is not fun to have sore armpits. Be aware that in this position you can inadvertently exert pressure on the serratus anterior with the back of your fingers.



Figure 11.12 Subscapularis massage with the fingers in the slot between the shoulder blade and ribs. The hand closest to the head of the table pulls the scapula toward the therapist.

Biceps, Brachialis, and Forearm Extensor Muscles

Find and treat biceps trigger points with a supported thumb or with the knuckles isolating each head of the muscle. A supported thumb can also be used to locate and treat brachialis trigger points just above the lateral epicondyle and under the outer edge of the biceps (figure 11.13). Search an area three to four inches starting at the elbow. Ideally, it is best to move the tissue in the direction you want it to go, which in this case is toward the elbow. Most folks have short, tight biceps and brachialis.

Massage the extensors with your same side forearm (figure 11.14). Paired supported thumbs also make an excellent tool for individual trigger points. This is the same tool that you use on the flexors (figure 11.38). Make a special search all around the head of the radius about an inch below the crease of the elbow for trigger points in

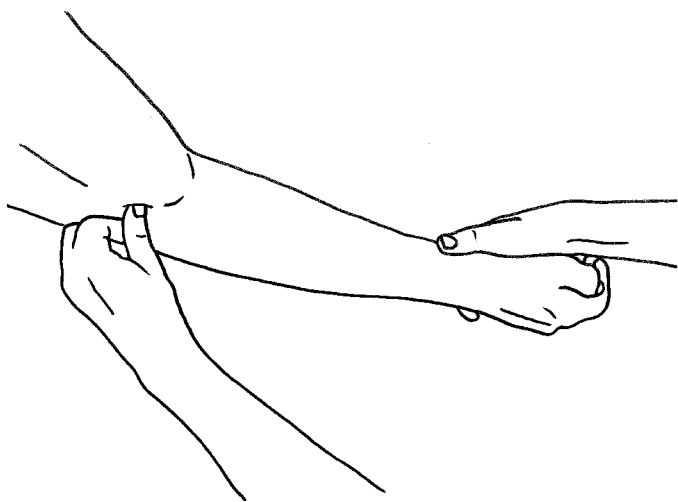


Figure 11.13 Brachialis massage with supported thumb under the edge of the biceps, just above the crease in the elbow



Figure 11.14 Extensors massage with the blade of the ulna stroking toward the elbow. Paired supported thumbs also work well.

the extensor carpi radialis longus, brachioradialis, and supinator. As you work, facilitate the search by rotating the forearm through pronation and supination with your other hand. The extensor carpi radialis brevis is about three inches below the elbow on the radius. The extensor digitorum is easiest to find on the back of the arm. Turn the palm down to massage the extensor ulnaris also about three inches below the elbow. Keep studying the anatomy of the forearm. You should aim at acquiring the ability to find and treat any of these muscles individually. Ask the client to contract each muscle in turn to identify it with isolated contraction.

Use your fingers to look for tender trigger points in the long thumb muscles on the back and side just proximal to the wrist. The muscles at the base of the thumb can be treated with a supported thumb (not shown). Treat the first dorsal interosseous also with the supported thumb (figure 11.15). The other interosseous muscles can sometimes be explored but are best left for careful self-treatment by the client with the tip of a supported thumb or the clamp-and-eraser tool (figure 6.48).



Figure 11.15 First dorsal interosseous massage with supported thumb stroking the muscle against the metacarpal

Sternocleidomastoid (SCM)

Sitting slightly to the side at the head of the table, cradle the base of the client's skull and back of the neck in your hand. Keep the head in neutral if possible and treat trigger points in the sternocleidomastoid muscles by kneading with your fingers and thumb (figure 11.16). Differentiate the sternal and clavicular branches of this muscle by feeling for the narrow trough between them. It is helpful to think of the clavicular branch as deep to the sternal branch rather than behind it. Each branch is about the diameter of the client's finger. To reach the clavicular branch, you must take all of the soft tissue on the side of the neck into your grasp. Have the client turn his head to the opposite side to feel the muscle contract. Beginning just below the ear, slowly search the muscle along its



Figure 11.16 Sternocleidomastoid massage by kneading between the fingers and thumb. Stroke following the fibers.

entire length, treating trigger points in both branches as you come to them. Use the flat pads of your fingers and thumb rather than the tips. The treatment stroke should be a short, repeated, milking stroke. If you have trouble keeping ahold of the muscle, learn to slightly let go just as it slips from your fingers. Note that you will have more control of the sternocleidomastoids if you treat them without lotion.

When the muscle is rigid with tension, the clavicular branch can be very difficult to grasp, particularly low on the neck where the two branches separate. To make a tight sternocleidomastoid easier to treat, slacken it by tilting the neck slightly toward the same side. Unless the muscle has been injured, any pain can be considered an indication of trigger points. Squeezing a healthy sternocleidomastoid doesn't hurt.

Your confidence and understanding will be greatly improved by mastering self-treatment. Use your laboratory: your own body.

There is little danger of inadvertently abusing the carotid arteries if you treat the sternocleidomastoids and scalenes as described. It's wise, however, to know exactly where the carotid arteries are. Feel for the pulse just below the jaw line. No matter how big your grasp of the side of the neck, you cannot pinch the carotid artery. But don't trust that rule; trust your fingers. If you feel a pulse, move away from it. It's unfortunate that so many therapists have been scared away from the front of the neck. It is such an important area to treat. Your confidence and understanding will be greatly improved by mastering self-treatment. Use your laboratory: your own body.

Scalenes

To effectively treat the scalene muscles, you need a clear mental picture of their location relative to the sternocleidomastoid. The anterior scalene may be the most difficult to treat, since it is entirely hidden behind the sternocleidomastoid. While seated at the top corner of the table, knead the SCM with your palm up. Your fingertips behind the SCM will be on the middle scalene. Let go of the SCM and turn your hand palm down. With two fingers, stroke with the fiber all the way down the side of the neck to the middle of the clavicle. Repeat the stroke, looking for areas of tenderness. To treat the anterior scalene, find the SCM again with a pincer grip, then let it go and turn your hand palm down. Firmly move the SCM toward the windpipe with the backs of the index and middle fingers (figure 11.17). In the correct position, the fingers will be partly covered by the sternocleidomastoid. Press the anterior scalene downward toward the table and against the vertebrae, searching its length all the way down to the clavicle. It is funny to think that hard structure under your fingers is the spinal column. We tend to think the bones are only in the back of the neck. Work the anterior scalene all the way down to its attachment on the first rib. The SCM attachment on the clavicle will be just medial to your fingers.

Scalene massage often reproduces the client's particular referred pain or numbness pattern. Pressure on scalene trigger points can also produce a subtle unpleasant electrical sensation in them that feels like you're pressing on a nerve. This doesn't happen after trigger points have been deactivated. Further, if you are pressing on an unhappy pinched nerve, the sensation will escalate from a 0 to a 10 on the pain scale. Clearly, this would be an area to avoid until the compression of the nerve is resolved.

The posterior scalene can be found just above the clavicle at the angle it makes with the thick roll of trapezius muscle on top of the shoulder. Pressure for the treatment stroke should be toward the client's feet. Use a short stroke with the middle finger along the top of the clavicle toward the neck (figure 11.18). With a deep chest inhalation, you may feel the posterior scalene contracting and the first rib rising against your fingers.



Figure 11.17 Anterior scalene massage with two fingers under the sternocleidomastoid and pushing it aside toward the windpipe



Figure 11.18 Posterior scalene massage with the middle finger pressing toward the client's feet and stroking along the top of the collarbone

If you're unsure of the location of the anterior or medial scalenes, palpate them while having the client repeatedly sniff in short, staggered breaths through the nose. This causes the scalenes to contract strongly so they can be felt more clearly.

Masseter and Pterygoid Muscles

While seated at the head of the table, massage medial pterygoid trigger points with your fingers or thumb against the inside of the lower jaw, just in front of the angle of the jaw. This is quite similar to the self-treatment technique (figure 4.44).

Standing at the elbow, facing the head of the table, treatment of masseter trigger points is simple and straightforward. Insert a gloved index finger inside the client's cheek. Find trigger points by kneading the muscle between the index finger and the thumb (figure 11.19) or the fingers of your opposite hand. Have the client clamp down to feel the muscle contract.

While still in the mouth, treat the lower border of the lateral pterygoid muscle in the small pocket behind and above the upper gum (figure 11.20). I think of this as the peanut butter pocket. It will be about the size of the tip of your index finger. Press upward, toward the top of the head and stroke forward toward the front of the face. This stroke is only about a quarter of an inch long. When the lateral pterygoid is in trouble, pain from the slightest pressure from your finger can be intolerable. Watch the client's face and work very cautiously. He can use his fingers to communicate numbers. It is also very beneficial to treat this muscle from the outside. Prop the mouth open with a small paper cup as shown in figure 4.47. Find the shallow hollow about an inch in front of the ear canal. In this hollow, stroke up and forward while supporting the head with the other hand. Detailed instruction for this technique can be found in the self-treatment section in chapter 4. If your state regulations prohibit therapeutic massage inside the oral cavity, simply teach your clients the self-treatment techniques.



Figure 11.19 Masseter massage between the index finger and thumb

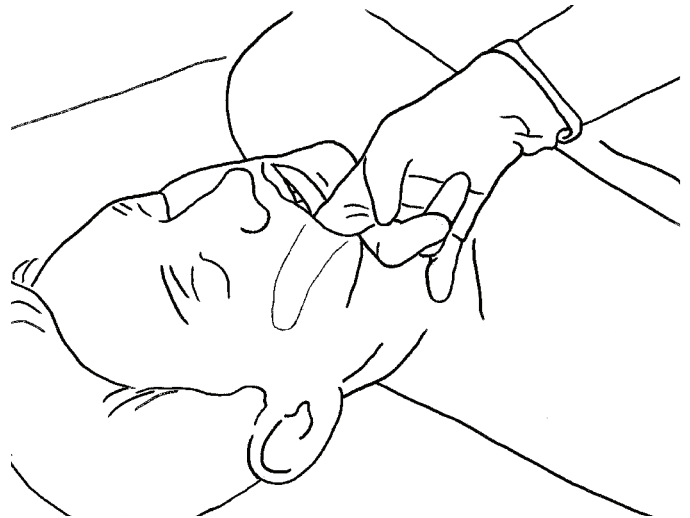


Figure 11.20 Lateral pterygoid massage with the index finger. Follow the outside of the upper gum all the way back, then press upward and stroke forward with tiny scoops.

Treating the Client Prone

While treating the anterior body first is often recommended, there are times when starting the client prone is preferable. Some reasons may include client comfort or preference, success of previous anterior body treatments, or time limitations. Either way—prone or supine—it is useful to begin the treatment with the upper trapezius. Because

trigger points in this muscle are so common (and recurrent), it is a great place to introduce the pain scale and to check in for general sensitivity.

Trapezius

Upper trapezius. Use the thumb and index finger to massage trigger point number 1 in the roll of trapezius muscle in the angle of the neck (figure 11.21). As described in chapter 4, this trigger point is just under the skin in a strand of muscle sometimes no thicker than a knitting needle. Since this little bit of muscle is hard to hold on to, let your fingers slip right off repeatedly.



Figure 11.21 Trapezius number 1 kneaded between fingers and thumb. Feel for the band of muscle right at the corner where the neck meets the body.

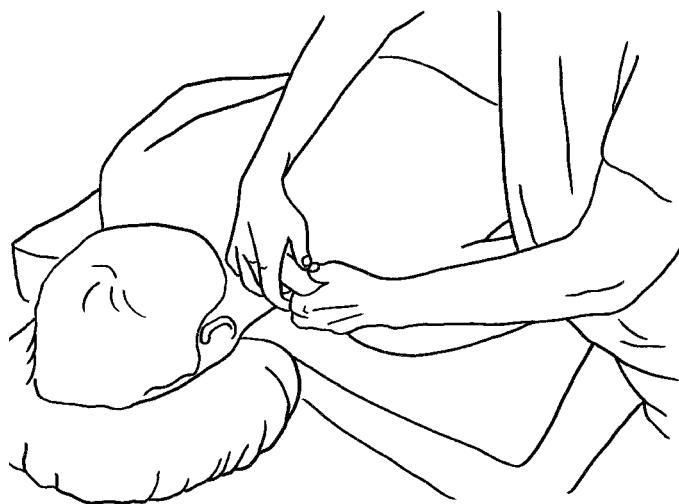


Figure 11.22 Trapezius number 2 massage with paired hands. Stroke with the thumbs either cross-fiber or with the fibers laterally.

To treat trapezius number 2 trigger point, stand at the client's elbow facing the head of the table (figure 11.22). Use both hands together to massage the muscle on the near side, grasping it with your fingers underneath and your thumbs on top, as shown. If this position is not comfortable, move to the head of the table and reposition your hands with the palms up. From either position, stroke along the muscle fiber with both middle fingers from the angle of the neck toward the outer shoulder. It also works well to massage the muscle across the fibers. Be aware that there may be two trigger points in this thick roll of muscle, one in the central part and another an inch or two toward the outer shoulder. The lateral trigger point is found just medial of the corner where the spine of the scapula and the clavicle meet. Grasping the front of the large roll of trapezius is critical in locating both of these points. While pressing just below the big roll of trapezius from the front with your middle finger, meet it from the back with your thumb to compress this lateral point. Stroke laterally with your middle finger.

Lower trapezius. Position yourself at the upper corner of the table and locate the inferior and superior angles of the scapula. The trapezius number 3 trigger point is halfway between these two bony landmarks, where the lower edge of the trapezius crosses the medial border of the scapula. This lower edge of the muscle feels like a speed bump as you rub your fingers along the medial



Figure 11.23 Trapezius number 3 massage with supported thumb while the other thumb keeps the muscle's lower border from moving

border. Keep the muscle from moving by placing one thumb just below its lower edge, just off the scapula (figure 11.23). Use the other thumb to stroke along the edge of the muscle in a diagonal direction toward vertebra T12. In the drawing, the therapist is massaging with her left thumb (supported) and trapping the muscle with the right one. The long, diagonal line on the right side of the client's back indicates the lower edge of the lower trapezius on that side. Remember that lower trapezius trigger points are primary trigger points. They can keep the upper trapezius and posterior neck activated, making neck pain and headaches hard to get rid of.

Levator Scapulae and Splenius Cervicis

Trace the levator from the base of the neck to the superior angle of the scapula. This is just two or three inches, depending on the size of the client. Notice how the levator makes an "X" with the thick roll of upper trapezius muscle as it goes underneath it. For treatment of the lower trigger point of the levator scapulae, use paired supported thumbs (figure 11.24). Scoop under the trapezius from its anterior aspect with your thumbs and feel for the superior angle of the scapula, stroking all around its contour. To make it easier on your hands, brace your elbow against your hip as you lean into this stroke, using your weight for the pressure. For more sensitive clients, you can massage this trigger point by working through the trapezius instead of under it with thumbs or supported fingers. To use supported fingers, stand at the client's elbow and stroke toward yourself (the hand positioning for this is shown in figure 11.33). To find the lower splenius cervicis trigger point, scoop up under the trapezius, aim toward T2, and press down onto the bone.

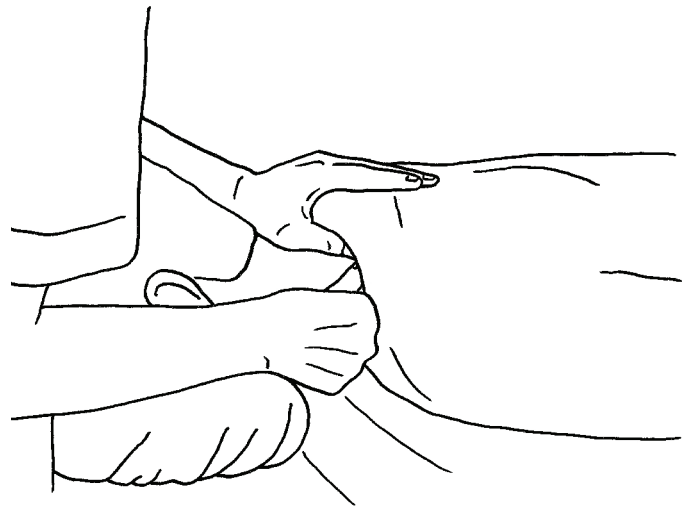


Figure 11.24 Levator scapulae number 1 trigger point massage with access under the front edge of the upper trapezius

Stand at the client's elbow, facing the head of the table. For the levator scapulae's middle trigger point, use one supported thumb to stroke the muscle against the ends of the transverse processes of the sixth cervical vertebra very low on the side of the neck (figure 11.25). The upper splenius cervicis trigger point is halfway up the side of the neck, on the transverse process of T3, immediately behind the sternocleidomastoid.

Posterior Neck

Warm and relax the neck with two-handed petrissage. Then, starting right next to the spinous processes, stroke from the base of the neck to the occiput and onto the skull with either supported fingers or paired thumbs (figures 11.26 and 11.27). With supported fingers, pull toward yourself. With paired thumbs, push away. Do several slow, parallel strokes toward the skull, searching the entire back and sides of the neck. Think in terms of the body being three dimensional, not just posterior and anterior. Be sure you can locate and trace all the posterior neck muscles, including the splenius capitis, splenius cervicis, semispinalis, deep spinalis, and suboccipitals using the details provided in chapter 4. The posterior neck is complicated. Be slow and detailed in your searching strokes. Remember that the more skill you acquire in treating your own neck, the better you'll understand the anatomy of your client's neck. Avoid pressing deeply into the suboccipital triangle. Read the "Suboccipital Muscles" section in chapter 4 for more instruction.



Figure 11.25 Levator scapulae number 2 trigger point massage with supported thumb against the transverse processes of vertebrae C6 and C7



Figure 11.26 Posterior neck massage from the base of the neck to the occiput with supported fingers

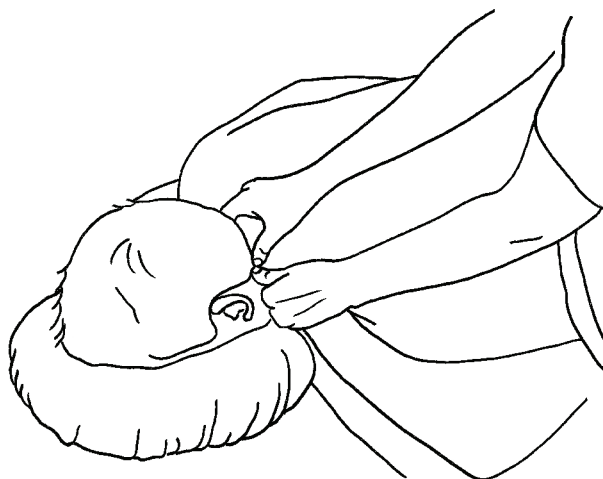


Figure 11.27 Posterior neck massage with paired thumbs stroking toward the occiput (avoid deep pressure to the suboccipital triangle)



Figure 11.28 Superficial spinal muscles massage with the elbow or the blade of the ulna. The thumb of the opposite hand serves as a guide to keep the elbow off the spinous processes.

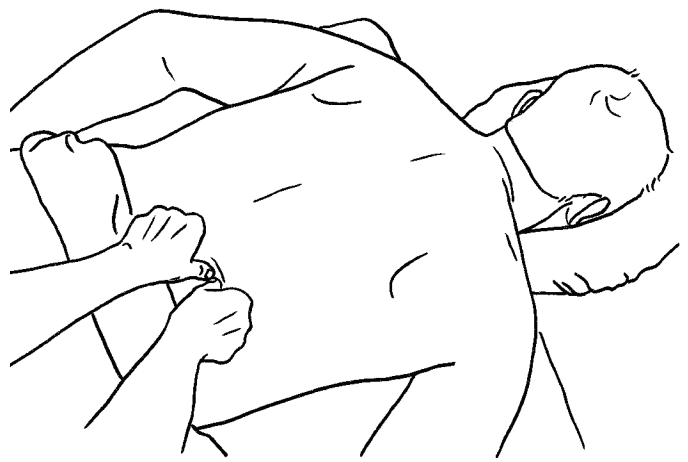


Figure 11.29 Iliocostalis massage with paired, supported thumbs, stroking up against the lowest rib

Superficial Spinal Muscles

Supported fingers, the heel of the hand, the knuckles, or your forearm can be used interchangeably for treating trigger points in the superficial spinal muscles. Middle trapezius and rhomboid trigger points can also be treated with any of these tools. When using your forearm or elbow, avoid pressing on spinous processes of the vertebrae. Notice in the drawing that the therapist's right thumb is keeping track of the spinal column and guiding the forearm (figure 11.28). Begin with a preliminary series of long, parallel strokes down the back, from the base of the neck to the pelvis, and then lateral strokes along the top of the hip bone. Cover the same lines again more slowly with deeper pressure and begin searching for trigger points.

To treat trigger points in the lower part of the longissimus and iliocostalis muscles, use supported fingers or paired supported thumbs and stroke upward against the lowest rib (figure 11.29). The longissimus is the thick, ropy muscle next to the spinous processes, and the iliocostalis is about two to four inches from them. Continue your stroke up two or three inches, looking for all four trigger points.

Deep Spinal Muscles

Paired supported thumbs work well for treating trigger points in the deep multifidi and rotatores muscles along the spine (figure 11.30). It's likely that you will find taut and tender diagonal fibers in the deep spinal muscles at the same vertebral level where you found trigger points in the superficial spinal muscles.

Work your way down the back, starting just below the seventh cervical vertebra. Reach cross-body and press both thumbs into the lamina groove, the narrow trough between the spinous and transverse processes. Stroke away from yourself with tiny scoops of your thumbs (the thumbs can work together or alternately). This stroke is extremely short and should not cross the fibers of the spinalis thoracis,



Figure 11.30 Deep spinal muscles massage with paired supported thumbs working cross-body in the narrow groove between the spinous and transverse processes of the vertebrae

because the effect can be quite irritating to the client and may even provoke a spasm. You'll feel the spinalis as a strong vertical band in the thoracic area, separated from the spinous processes by no more than half an inch. Treat trigger points in spinalis muscles with strokes along the fibers.

Serratus Posterior Superior

To reach trigger points in the serratus posterior superior muscle, you must move the scapula to the side. Notice that the client's arm is hanging over the end of the massage table (figure 11.31). Under the face cradle, the therapist is pulling the client's wrist toward the opposite side, which helps move the scapula even farther away from the spine. Be mindful of pressing the arm into the face cradle. Search for trigger points right next to the medial border of the scapula, very close to the superior angle. A gentle forearm or supported thumb is a good tool to use here. Alternately, you can treat the serratus posterior superior in the supine position with the client's hand resting on his opposite shoulder as described in the "Subscapularis" section.

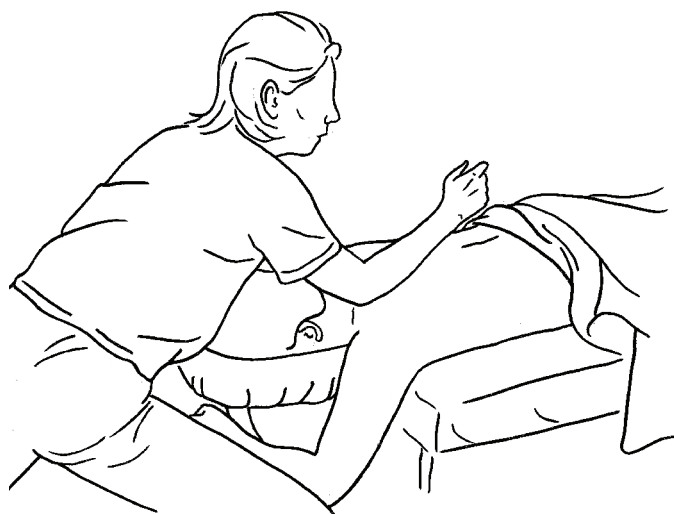


Figure 11.31 Serratus posterior superior massage with the blade of the ulna. The therapist is grasping the client's left hand and pulling the arm cross-body to help move the shoulder blade out of the way.

Supraspinatus

Treat supraspinatus trigger points with double supported thumbs from the head of the table (figure 11.32). Keep your wrists straight, and then simply lean in, using your weight for the pressure. Focus on the small triangular space between the superior angle and the spine of the scapula. Use short strokes toward the outer shoulder to treat this deep central trigger point, and then move a short distance farther out to where the muscle dives under the acromion. If this outer trigger point is present, it will feel highly sensitive, very much like a bruise. Treat this part of the muscle a little more gently.



Figure 11.32 Supraspinatus massage with paired supported thumbs. The thumbnails face one another, and the stroke follows the spine of the shoulder blade laterally.

Infraspinatus and Teres Minor

Use supported fingers or paired supported thumbs to treat the infraspinatus (figure 11.33). Infraspinatus trigger points can be present in several places below the scapular spine between the medial and lateral borders. The most lateral trigger point is in the outer edge of the muscle. This band of muscle parallels the lateral border of the scapula about an inch medially. The infraspinatus often needs multiple deep strokes before trigger points “wake up” and begin to produce the familiar sense of exquisite tenderness. Notice that the therapist is showing good body mechanics in keeping her neck and spine straight and in using her body weight to exert pressure.

Use supported fingers also for the teres minor, searching along the lateral border of the scapula, about an inch above the crease of the armpit. This muscle is about the size and thickness of an index finger. When it’s tight, you may be able to feel it crossing high on the lateral border toward the head of the humerus.

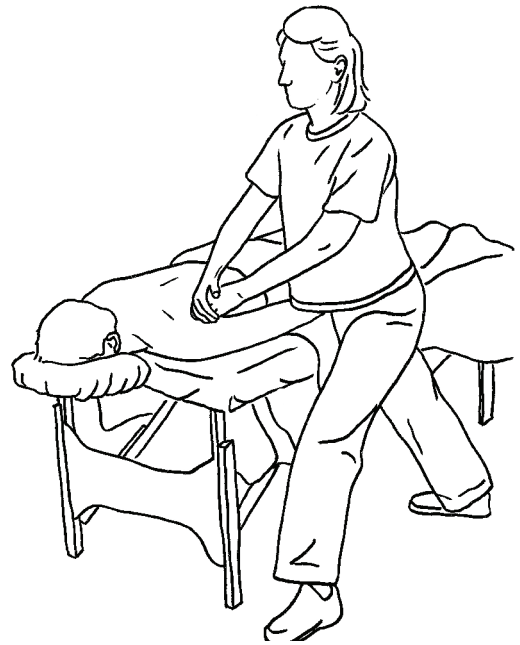


Figure 11.33 Infraspinatus and teres minor: The edge of the right hand is on the body and does most of the work in moving the fingertips of the left hand. Relax the left hand and move the skin with the tool.

Latissimus Dorsi and Teres Major

The latissimus dorsi and teres major can be treated by kneading with fingers and thumb, reaching across the body (figure 11.34). You can differentiate the two muscles by feeling for the narrow trough between them. Teres major is the deeper, thicker muscle. Treat each point independently. The teres major can also be pressed against the bone with supported fingers, halfway down the scapula’s lateral border (not shown). The outer edge of the lower part of the latissimus dorsi can be treated by grasping and kneading it with both hands (figure 11.35). You can also use supported fingers on these muscles on the side nearest you.



Figure 11.34 Latissimus dorsi and teres major kneaded between fingers and thumb cross-body. This can also be done from the head of the table.



Figure 11.35 Latissimus dorsi massage by kneading between fingers and thumb of both hands cross-body, using very specific, short strokes

Serratus Anterior

Serratus anterior trigger points can be treated by reaching across the body with supported fingers, as shown (figure 11.36). Alternately, you can treat the side nearest you, using supported fingers with the palms up. The primary trigger point in the serratus anterior lies on the most prominent rib about a hand's width down from the armpit. If you find this primary trigger point, search the entire side of the rib cage for trigger points in other bellies of the muscle.



Figure 11.36 Serratus anterior massage with paired hands cross-body, about a hand's width down from the armpit

Deltoids, Triceps, and Forearm Flexors

Massage the deltoids first with the heel of your hand to warm them. Then use either the knuckles of an open fist or a supported thumb for specific trigger points (not shown). Explore any taut bands for tender trigger points. Deltoid trigger points should be treated when the client is both prone and supine. For treating the triceps, let the client's arm hang over of the side of the table (figure 11.37). Offset the supported thumbs from one another. This will bring your hands a little closer together and let you use the knuckles of your fingers to keep the arm in position. You can treat all five triceps trigger points with this tool. You may want to try working the medial trigger point near the elbow by kneading it between fingers and thumb (not shown).

To massage the forearm flexors, place the arm back on the table with the palm up. Use double supported thumbs for specific trigger points (figure 11.38). Supported fingers or a gentle forearm are also valuable tools. Most of the trigger points in the inner forearm will be in an oval-shaped area that extends three or four inches just below



Figure 11.37 Triceps (long head) massage with offset, paired, supported thumbs, stroking away from the therapist



Figure 11.38 Flexors massage with offset, paired, supported thumbs, stroking toward the medial epicondyle of the elbow. This can also be done with the knuckles of an open fist or the blade of the ulna.

the crease of the elbow. Use isolated contraction to identify specific muscles and trigger points. Remember that the large flexor pollicis muscle of the thumb occupies the middle third of the inner forearm. Its trigger points not only cause thumb pain, but are also the cause of locking or catching in the last thumb joint. Although it may contradict what you have been previously taught, it is best to massage the flexors toward the hand (Waslaski 2012). Most people have short, tight flexors that need to be lengthened. Unless there is a circulation condition or edema, this should not create any problems. After the deeper strokes, use superficial strokes to direct the lymph back up the arm.

Quadratus Lumborum

Use paired thumbs or paired hands for treatment of quadratus lumborum trigger points (figures 11.39 and 11.40). To differentiate the muscle from the spinal muscles, have the client hike the hip several times to make the quadratus lumborum contract. The quadratus lumborum is deep to the thick, superficial spinal erector muscles. To massage it, you must scoop up under the spinal muscles three to four inches away from the spinous processes.

Face the head of the table when working the QL with supported thumbs on the same side (figure 11.39). Treat the upper lateral trigger point by searching the spot where the outer edge of the muscle attaches to the lowest rib. This outer trigger point may feel like a bruise. Then aim your pressure into the corner where the lowest rib meets the transverse processes. Scoop up underneath the thick spinal erector muscles and aim for the opposite shoulder to find the upper medial trigger point.

Search your way down the QL, scooping deep under the erectors and pressing the muscle into the underlying transverse processes. Stop and treat any area of tenderness that you find. Reposition your body to face toward the gluteal muscles. Angle into the corner the pelvis makes with the lowest transverse processes. Staying three to four inches away from the spine, under the erectors, aim toward the opposite greater trochanter to find the lower medial trigger point. For the lower lateral trigger point, reposition your body to face the feet. Search for the lateral trigger points at the spot where the outer edge of the muscle attaches to the pelvis.

As an alternative to your thumbs, you can reach across the body and treat these same four places with paired hands (figure 11.40). Start all the way across at the abdominal obliques and then lean back, using your weight to pull your fingertips toward you. Stop when you reach the spinal muscles. Shorten this stroke to treat specific trigger points.



Figure 11.39 Quadratus lumborum massage with paired thumbs at the lowest rib and transverse processes of the vertebrae. The pressure is toward the opposite shoulder.



Figure 11.40 Quadratus lumborum massage cross-body with paired hands, stroking at the lateral border of the muscle. Lean back and pull.

Piriformis and Gluteus Muscles

Massage of the gluteal area can be on the bare skin, through a sheet, or even through thin shorts or slacks. Tools include your choice of a gentle elbow, supported fingers, supported knuckles, or supported thumbs. Your elbow may be the most ergonomic tool because you can use your weight to apply pressure (figure 11.41). Begin by palpating the location of the top of the hip bone, sacrum, greater trochanter, and ischial tuberosity (sit bone). These bony landmarks are vital in guiding you to specific trigger points in this otherwise ill-defined area.

Search the gluteus medius for its first trigger point beside the lateral edge of the sacrum. This point is in a shallow hollow just below the rim of the pelvis. Work your way laterally across the gluteus medius toward the side.

Find the second gluteus medius trigger point halfway across the buttock just where it starts to curve to the side. The third trigger point will be on the side of the body about three inches posterior to the ASIS. With all three of these points, press the muscle upward toward the rim of the pelvis.

Continuing on the side of the body, move inferior an inch and search back across toward the sacrum. You may find gluteus minimus trigger points along this line and in a third line another inch down, just above the greater trochanter. This area may be loaded with many tender spots. Piriformis trigger points lie on a line just posterior of the trochanter and at about the center of the edge of the sacrum. Approach the second piriformis trigger point with caution because it can overlie the sciatic nerve.

The upper trigger point in the gluteus maximus may be found at the edge of the sacrum, perhaps superficial to the second piriformis trigger point. For the lower trigger point in the maximus, press the muscle straight down onto the upper lateral side of the ischial tuberosity, or sit bone. This is a different point than the hamstring attachment, which is pressed from below up against the inferior aspect of the sit bone. You may find other maximus trigger points against the medial side of the ischial tuberosity. Ask the client's permission before checking for this point next to the tailbone. You may prefer to instruct the client in self-treatment for this one.



Figure 11.41 Buttock muscles massage with the elbow. This can also be done with supported fingers.

Hamstrings

Finding the easy way, use supported knuckles, supported fingers, or your forearm for treating trigger points in the hamstrings (figure 11.42). Starting just above the knee, use long, searching strokes all the way to the ischial tuberosity. One stroke will follow the semimembranosus and semitendinosus. The other stroke will follow the biceps femoris. Notice that these two lines begin on opposite sides of the knee and make an inverted “V,” ending at the sit bone. Trigger points may be found anywhere along the semimembranosus and semitendinosus muscles, but only in the middle third of the biceps femoris. It is also possible to treat the hamstrings going in the opposite direction, as when the pelvis is in anterior inclination or tilt (Waslaski 2012).

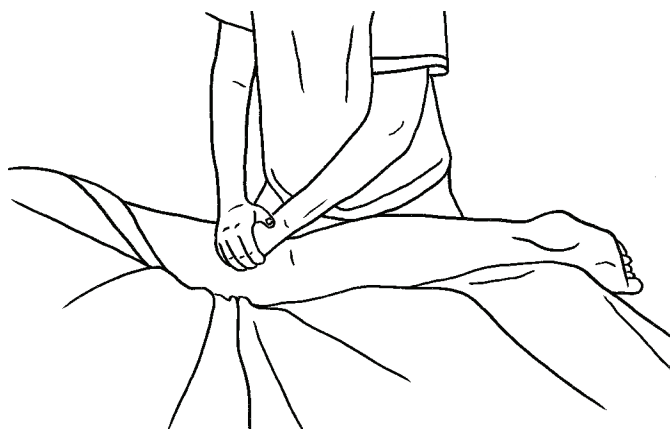


Figure 11.42 Hamstrings massage with supported fingers. This can also be done with supported knuckles or the knuckles of an open fist, palm up.

Calf Muscles

The safest and most ergonomic tools for the calves are supported fingers or supported thumbs, which penetrate with minimal effort (figure 11.43). To save your hands, don't use kneading strokes for massage of calf muscles. Very often, trigger points in calf muscles have never been treated specifically, especially in the three deep muscles. The calf can be a very tender area on many people. It's wise to progress slowly with successively deeper strokes.

Begin by defining the lower edge of the gastrocnemius by mentally drawing a line across the back of the lower leg about halfway down. If the muscle is well shaped, its lower edge will be somewhat irregular, with the medial head coming lower than the lateral head. Next, draw an imaginary line down the middle of the calf to mentally separate not only the heads of the gastrocnemius but the two bones of the lower leg, the tibia and fibula. It's helpful to be able to visualize what's hidden beneath the skin.

In each head of the gastrocnemius, look for a trigger point in the center of the muscle belly and also close to the crease of the knee. You may find a deep soleus trigger point between the two lateral gastrocnemius trigger points. Just below the bottom edge of the gastrocnemius, find the two lower soleus trigger points, barely over the midline on either side. The medial or big toe side trigger point causes heel pain. The lateral or little toe side trigger point causes low back pain. The rare but important trigger point that causes jaw pain lies in a trigger area about 2 inches in diameter starting at the medial trigger point. Search from just below up onto the gastrocnemius an inch or two.

You will access the tibialis posterior and flexor digitorum longus between the heads of the gastrocnemius. To treat the tibialis posterior, find the very center of the gastrocnemius, press down between the two heads, and then stroke up about an inch and laterally an inch to massage the tibialis posterior against the fibula. Don't let your fingers slide onto the thick belly of the gastrocnemius. Stay between the heads. Go easy at first; this is often very tender.

The flexor digitorum longus can be massaged in the same way, only this time pushing the gastrocnemius medially toward the tibia (inner side of the leg). Find the very center of the gastrocnemius, press in, stroke up an inch and medially about an inch. Massage the muscle against the tibia with short, repeated strokes. The flexor hallucis longus trigger point is just below the gastrocnemius at the midline of the calf deep to the lateral soleus trigger point. Press into the spot and then laterally toward the fibula.

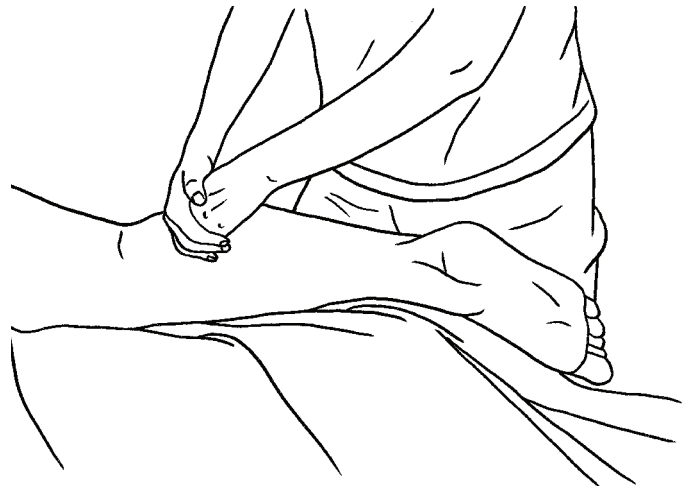


Figure 11.43 Calf massage: The edge of the right hand contacts the skin and moves the fingertips of the left hand.

Morton's Foot Syndrome

To check for Morton's foot, compare the relative lengths of the first and second metatarsal bones to see if the second is longer (figure 11.44). Press the toes back with your thumb while pushing up on the heads of the first and second metatarsals with your fingers. This will make the heads of the two metatarsals stick out enough to see or feel them. Look for a heavy callus under the head of the second metatarsal, which is a strong indicator that the bone is too long (figure 10.39). An extra-long web between the second and third toes is another indicator of Morton's foot.

If the toes won't bend back to expose the heads of the metatarsals, it's very likely that you'll find that the extensor digitorum longus and interosseous muscles are being kept shortened by trigger points. The next step is to do a standing evaluation for an elevated first metatarsal, as described in the section "Morton's Foot Syndrome and Elevated First Metatarsal" in chapter 10. The simple treatment for Morton's foot and an elevated first metatarsal is to put a pad in the shoe under the head of the first metatarsal or to purchase insoles from www.mortonsfoot.com. This is described in detail in chapter 10.

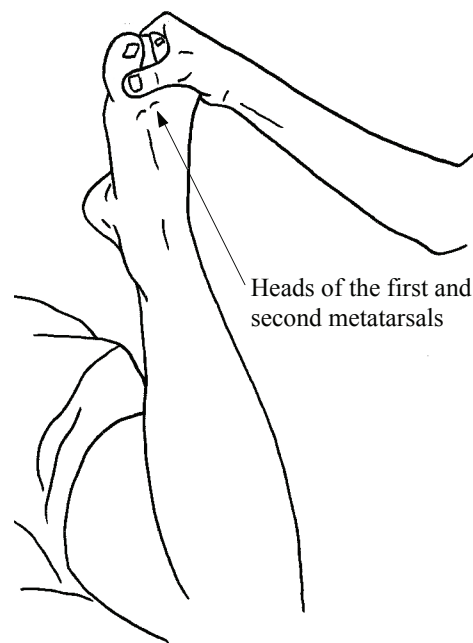


Figure 11.44 Checking for Morton's foot. Pull back with the thumb and push up with the fingers.

Plantar Foot Muscles

To massage the seven muscles in the bottom of the foot, use paired hands so that several fingers can share the load (figure 11.45). Search the side of the foot just down from the big toe and then beside the heel on either side. The flexor hallucis brevis and abductor muscles have trigger points on the outer edges of the foot. A supported thumb works well for the deep quadratus plantae muscle (figure 11.46). Use a supported thumb or your fingertips to search between the metatarsals for interosseous trigger points (not shown).



Figure 11.45 Plantar foot muscles' massage with paired hands

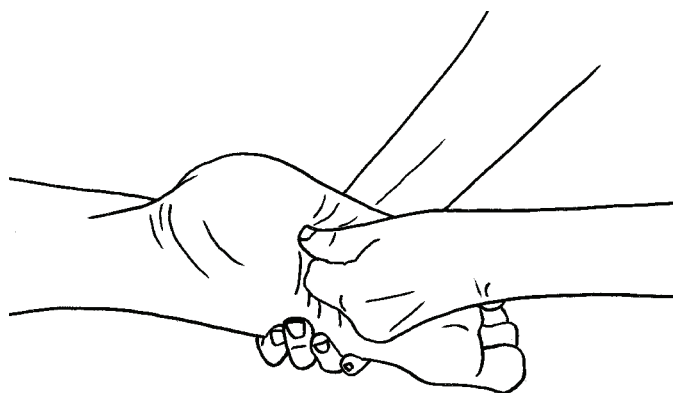


Figure 11.46 Quadratus plantae massage with supported thumb stroking laterally, immediately in front of the heel bone

Deep trigger point massage to the plantar side of the foot is often extremely hard work for the therapist. It's enough to simply locate and briefly treat the trigger points. Show the client how to use a 35 mm high bounce ball for self-treatment.

Trigger Point Therapy and Your Practice

This book presents quite a bit of information, and it won't be learned overnight. Find a buddy interested in trigger point massage to practice with regularly. Doug Nelson with Precision Neuromuscular Therapy has another great idea: ask your clients if they can stick around for an extra five or ten minutes at the end of the session for you to practice your new techniques. They will appreciate the extra free work and you will get more experience and opportunity to hone your skills.

It is helpful to take this book to your local copy shop and have a spiral binding put on it. Also, make copies of trigger point and self-treatment diagrams for your clients or patients. If you are making lots of copies for one person, why not sell them the book? Go to www.triggerpointbook.com for small orders, or, for wholesale purchases, visit the publisher online at www.newharbinger.com/24946. If you are interested in taking your education and practice to the next level, I encourage you to become certified by one or more of the continuing education providers listed in the Resources section in the back of the book.

Chapter 12

Muscle Tension and Chronic Pain

by Clair Davies
(edited by Amber Davies)

Chronic, excessive muscle tension can promote and perpetuate trigger points, thereby undermining the effectiveness of trigger point therapy. The release of habitual muscle tension can be an important part of the therapy for chronic pain (Simons, Travell, and Simons 1999).

Millions of people use some form of systematic relaxation to cope with stress. I'm one of those people. I learned Dr. Edmund Jacobson's progressive relaxation thirty-five years ago as a part of treatment for nervous tension, and I've used it practically every day since. I've refined the method quite a bit over that time into two distinct parts, which I've named *passive tension flooding* and *active tension release*. I believe these techniques are an improvement on progressive relaxation. You may want to give them a try, particularly if you've had trouble getting your tension under control with other methods.

My active tension release procedures have grown out of Jacobson's progressive relaxation, in which you release the tension from your body in a systematic manner, part by part. Early in his career, Jacobson advocated contracting muscle groups in succession to identify muscle tension, before consciously relaxing them. Although he later moved past the idea of contracting the muscles first, the idea stuck around and is a central part of modern descriptions of progressive relaxation. I discovered on my own that it isn't necessary to contract the muscles to become aware of muscle tension, and sometimes it is counterproductive. Later I read in Jacobson's writings that he had a similar discovery. In the following description of active tension release, you will learn how to tune in and detect muscle tension without tightening your muscles further. When you've acquired enough skill, it's possible to relax your whole person instantly upon the first perception of a state of tension.

Passive tension flooding is an approach directly opposite of active tension release. Instead of attempting systematic relaxation, which can be very difficult when you're right in the midst of stress, you passively immerse yourself in your tension until it peaks and disperses on its own. Passive tension flooding is related to the various methods of desensitization that ask you to face your fears and fully experience the associated feelings. With passive tension flooding, however, you center your consciousness on the tension in your muscles. It bypasses the cognitive aspects of emotion and deals in a very direct and practical way with muscle tension, emotion's chief physical symptom.

Passive tension flooding facilitates a deeper level of active tension release and is perhaps the most powerful part of the method. In my own quite extended experience with it, passive tension flooding can quickly cut through the most intense states of anger and emotional distress, while diffusing high levels of otherwise unmanageable muscle tension. Without the stimulus of excessive and habitual muscle tension, muscles are less apt to develop trigger points and most pain problems can be resolved much more easily.

Anecdotal Evidence

I have no imposing academic credentials that would supposedly qualify me to talk about the therapeutic use of relaxation, but I think I do have the right to claim the provisional authority of my own experience. I believe anecdotal evidence holds an important place in science. It is usually personal experience that leads scientists to ask the questions that lead to objective research. Without that comprehensive research, I believe it's necessary to tell you about my own experience with systematic relaxation.

Back When I Was an Actor

First, I have to tell you about the crisis that led me to learning progressive relaxation in the first place. The story begins thirty-five years ago when I was a young man. For three years, I had been trying to break into theater, finally abandoning a successful piano business in New York in pursuit of a career as an actor. In the fall of 1968, I had just finished my second season of summer theater in Harrodsburg, Kentucky, which is about thirty miles from Lexington. After the first season, I had spent the intervening year wandering about the country in the midst of a classic existential crisis. I was a piano tuner who wanted to be an actor. Or a playwright. Or a professional guitarist. Or something! I loved working on pianos, but I wanted to do something more important in the world. The truth is that at the age of thirty-one I didn't know what I wanted. I was a pretty mixed-up lad.

On my drive back to New York City from Harrodsburg, in another fit of confusion, I realized that returning to the city was not the right thing for me to do. Sitting beside the highway in Virginia on that foggy, damp day, I puzzled through all these things, trying to see where it was all supposed to lead me. Somehow the gentle rain and the simple beauty of the glistening roadside greenery finally began to clear my mind. I realized I really didn't want to trade the greenness of the country for the bricks and asphalt of the city. Why couldn't I simply turn the car around and go back to Lexington for a while? Kentucky was a beautiful place to be when the leaves were turning. Lexington was big enough to have a good psychiatrist somewhere in it. I would find that guy, whoever he was, and stay in Kentucky until I knew what I wanted to do with myself. If only I could just stay in Lexington and make my living as an actor! I didn't want to go back to a regular life again. Every thought of having to tune pianos again made me angry.

I went on with my new plan. I found that good psychiatrist, Dr. Hugh Storrow, a professor in the University of Kentucky Medical School, who had a private practice in the community. I had confidence in Dr. Storrow at first sight, and my trust in him grew as we talked. He was calm and in control. I told him of my unstable, unsettled, directionless life, and how I seemed to run from one thing to another, not trusting myself to stick to anything, to resist the "greener grass." I also touched on my uncertain relationships with people, my tendency to get angry and shut out even my best friends when things got sticky. I also told Dr. Storrow I needed help with noises. I had always been horribly irritated by eating sounds—forks on teeth and the grinding and smacking of lips. I said I wanted a wife and children, and I could foresee my problem with noises being an obstacle. In a way, the noise problem seemed central to all my other difficulties.

Dr. Storrow told me he had recently published a book on his methods and that I could probably find a copy in the library. I was so fired up with enthusiasm for the man that I read his entire book, *Introduction to Scientific Psychiatry* (1967), before our next appointment.

Sounds and Noises

At my second meeting with Dr. Storrow, he asked me to outline a little more of my history. I told him I had grown up a very tense, nervous boy, tormented by my hypersensitivity to sound. Even a slight whistle in someone's

nose could throw me into a state of extreme distress. My mother had been like that. She'd told me once that she almost died when she realized I was going to be like her.

I told him it wasn't unusual for Mom to get so upset about eating noises at meals that she would have to run to the bathroom and throw up. She made my dad so self-conscious and awkward about his eating that he made even more noise. Then his nose would begin to run, and he'd sniff all through the meal. I suspected him sometimes of doing it on purpose. I suspected everybody of doing it on purpose.

Mom constantly tried to relax, but only succeeded in becoming as motionless and still as a statue. I could feel her tension when she was in the room, and it made me tense, too. It made me nervous to see her chest moving when she breathed. It made me try not to move my own chest. I was careful not to make any breathing sounds. I hardly breathed at all. That was family life for me.

Naturally, I had trouble in school with other kids' gum chewing and nose noise. I could detect a whistling nose clear across the room. My solution was to surreptitiously keep a finger in one ear. When I went away to college, the snoring of my roommates drove me crazy, and I stopped talking to them. Later, after I had dropped out of college to join the Coast Guard, I slept with rolled up Kleenex in my ears and a pillow over my head. After leaving the Coast Guard, something led me to piano tuning, which was a fitting use of my hypersensitivity to sound, but it just brought me more trouble with noise. It's the tiny harmonics that you listen to when tuning a piano and it doesn't take much to drown them out. It was an unending battle with barking dogs, washing machines, lawn mowers, television sets, and noisy children.

I finished my short biography by telling Dr. Storrow about the trouble I'd recently had with eating sounds in a restaurant, about getting so upset and angry that I left without finishing my meal. He listened and asked a few more questions. Then he said he would like to start reducing my anxiety with relaxation exercises. He also wanted to begin conditioning me for hypnosis, with which he hoped to extinguish needless nervous tension and bring to light repressed feelings regarding situations and people. Storrow said his techniques were based largely on systematic desensitization, a therapy developed by a South African psychiatrist named Joseph Wolpe.

He told me to begin observing my feelings in social situations and to start working with the relaxation exercises in a little blue pamphlet he gave me. I was eager to start doing the relaxation procedure, and I was delighted when I discovered how well it worked right away. Some sessions were so good that I'd go to sleep right in the middle of the exercise.

Desensitization

I kept a journal all the while I was going to Dr. Storrow. I still have it—seven spiral notebooks full. On September 26, 1968, after my third session with him, I made this entry about a remarkable event, every detail of which still remains a crystal-clear memory:

I have had a day! Storrow hypnotized me, much to my surprise. A truly amazing experience! Seemed to remain fully conscious—not asleep or in a trance, as hypnosis is described. I would say I could have stopped any time I wanted, especially through the induction. He said that whether it worked was dependent on how well I concentrated. It really seemed to be a matter of responsiveness and cooperation. It worked because I wanted to be hypnotized.

First, he told me to put my attention on a spiral figure printed on a card. While I looked at the card, he told me to begin relaxing. We commenced with the fingertips of my right hand, then bit by bit up to the shoulder. Then we worked with my left arm segment by segment and then the right leg, relaxing each bit in turn. All the while, he was telling me my eyes would soon close from sleepiness. Very shortly my eyelids drooped and then did close. He immediately went to work on my body as a whole—telling me that with each breath I would get heavier and more relaxed. I got very relaxed, to say the least, much more so than I had been able to achieve on my own.

Then he had me visualize going into the restaurant where I had had the trouble with eating sounds. He said the object was to recreate the scene as vividly as possible. He told me to sit at the counter and try to imagine how everything looked. He said that as I begin studying the menu, someone starts slurping coffee. I immediately sensed tension start up in several areas. He said to keep my attention on the sounds, creating all the detail I could. As we continued with the “dream,” tension increased dramatically in my wrists, forearms, and fingers. The fronts of my thighs got so tight that they went numb and began to tingle. The greatest tension imaginable built up in my lower chest, stomach, face, arms, and upper legs. I couldn’t believe how quickly it all came on.

Then he said to imagine that I hear someone just one stool away smacking their lips as they chew. Then I hear someone else behind me scraping their teeth on their fork with every bite. I felt an immediate increase in tension that quickly turned into pain in my left wrist and left leg. I cried out “No! No!” I didn’t want any more tension and pain, but he kept me in the dream. The tension was incredible, but at one point I began to laugh. He asked why I laughed. I said it was because I didn’t believe this could happen to me. I’d seriously doubted that I could even be hypnotized. He told me to stay with the picture and to continue observing the physical sensations very closely.

After a few minutes, the most amazing thing happened. The tension suddenly subsided to about half—all on its own. After I sat in the state of half tension for several minutes more, it occurred to me that I could make the rest go away. And I did! He asked me to indicate when it all went to zero. He said the scene in the restaurant was fading now and the sounds were dying away. I was again as heavy as a chunk of lead. I gave the signal that I was relaxed again. Then he told me I would feel better than I had in months and woke me on the count of five.

When I left Storror’s office that day, I felt like my feet weren’t touching the floor. I was so relaxed all the rest of the day it was like still being in the dream. I had a surprisingly productive day calling on churches and getting piano work, actually doing what I hadn’t thought I wanted to do. The deep relaxation wore off, of course, and I went to bed extremely tense that night. I tried tension control but couldn’t get it to work. Then I had diarrhea and vomiting all night. It felt like I was purging everything in my life that had come before.

Back to Reality

During the eighteen months I worked with Dr. Storror, we had many similar sessions of hypnosis and systematic desensitization, and I learned that nervous tension was no big deal. I began feeling that I could handle it, and I began finding my way. During that time, I acted in several plays at Studio Players. And I met a girl in one of the shows. Half-Sicilian and half-Scandinavian, she was the most beautiful girl I’d ever seen. She really turned things around for me, and in no time we were married. I still didn’t know exactly who I wanted to be, so just to make good use of the time, I went back to school. I finally got a degree, with a double major this time—psychology and theater arts!

Not long after my therapy ended, our first daughter was born, and it hit me that I was going to have to get serious and get some money rolling in. I committed myself anew to my profession as a piano technician, but with much less conflict than before. My obsession with acting died after I got the theater degree, but by then I was acting a far more fitting role, that of husband, father, and provider.

I began to understand that I’d always tried too hard at the piano work. I’d tried to be too good, tried to be better than I needed to be. I don’t think I’d ever seen the enormous tension this created in me. With my increased awareness of muscle tension, I also woke up to the fact that piano tuning, or any piano work, required a lot of bracing and holding of tense positions. I was overdoing that too, bracing tighter than was necessary and adding to my excess tension. Maybe that had been why I kept trying to get out of the tuning business. I think acting attracted me because it gave me a chance to blow off some of that tension. But now, my growing skill at systematic relaxation

was making the piano work less taxing. I began to enjoy its satisfactions, not the least of which was some very good money.

After my first successes with progressive relaxation, I realized that my hypersensitivity to noises could be used as an index of my general state of nervous tension. When I noticed that a noise was bothering me, I would immediately check my muscles for tension. I was always surprised at just how tight I was, without even knowing it. Noise annoyance became a signal to use my techniques.

Systematic relaxation has effectively solved my noise problem and has made me better at coping with things in general. I'm much calmer about everything than I used to be and more productive in much more meaningful ways. I want to make it clear, however, that it took years, not just weeks or months, to make systematic relaxation a consistently effective habit. Even now, when I'm worn out by stress or overwork, noises can get to me. Still, if I have the presence of mind to use what I know, the problem never lasts longer than it takes me to do a quick tension release.

Habitual Muscle Tension

It is well-known that nervous tension, or anxiety, causes overactivity of the autonomic nervous system, increasing your heart rate, blood pressure, respiration, muscle tension, and metabolism to levels far beyond reasonable needs. Muscle tension is a primary expression of nervous tension, but unlike all these other reactions, it's subject to virtually complete direct control. This fact holds enormous promise, because a reduction of muscle tension can have a strikingly immediate effect in reducing anxiety. In fact, tension release can be your most powerful and direct means of moderating anxiety. When nervous tension or anxiety gets out of bounds, an ability to relax your muscles can very quickly return you to a calmer state. If you don't have this ability, you are liable to be at the mercy of your emotions, which can lead to chronic states of both emotional and physical pain (Jacobson 1964).

Muscles that are habitually tense because of nervous tension are in a continuous state of nervous preparedness, braced for action. They never get a break, never get a chance to rest. Over time, this unnecessary overuse of your muscles can be a significant factor in the persistence of trigger points. The release of excess muscle tension can make trigger points more responsive to treatment and less likely to come back. Unfortunately, relaxing your muscles will not get rid of trigger points directly. Trigger points require a more direct approach.

Many people have little awareness of tension in their muscles and too often have no idea how to obtain a sense of calm without drugs, tobacco, alcohol, or mind-numbing distractions like television. Stress-relieving activities like gardening, sports, or hobbies can sometimes be anything but relaxing physically and can actually leave people with even more tension in their muscles due to overuse, strain, or excessive concern.

Obviously, some muscle tension is necessary in order to function. Movement, and indeed life itself, isn't possible without the contraction of muscles. But stress and strain and nervous concern tend to leave residual muscle tension in their wake. If this tension becomes excessive and habitual, it not only can contribute to a deadly cycle of mounting nervous tension and anxiety but also can seriously undermine your physical health. Among other things, habitual excess tension in skeletal (external) muscles keeps your blood pressure high, fosters disease-producing tension in your internal organs, and weakens the immune system (Jacobson 1967).

Active Tension Release

My method of systematic relaxation is based on the procedure that Hugh Storrow taught me thirty-five years ago. Day after day of practical use, however, has allowed me to continually refine it. Active tension release should be learned before you try passive tension flooding, which requires considerable skill in detecting tension in muscles. You will acquire that skill by practicing active tension release. A lack of awareness of muscle tension is the biggest

obstacle to deep relaxation. You may think you're relaxed, when in reality you're only partially or superficially relaxed at best.

Active tension release is derived from Jacobson's original progressive relaxation system, but is much simplified and has more options. Active tension release can be a long, detailed festival of relaxation, or it can be shortened to varying degrees for varying needs. To get a high degree of skill at relaxation, you need to patiently practice the long routine for quite a long while. Many people have tried to simplify Jacobson's method, which has unfortunately resulted in codifying the technique as contract/relax, an oversimplification that is very different from what Jacobson intended.

Progressive Relaxation

Edmund Jacobson (1885–1976) is widely recognized today as the originator of progressive relaxation, his highly structured method for releasing needless tension in principal muscle groups, one after the other. His discovery occurred in 1908, when he was finishing work on his third doctorate at Harvard. (He ultimately had doctorates in medicine, physiology, and law.) Unfortunately, he was afflicted with a very common problem. His mind was still going so fast at the end of the day that he had great difficulty sleeping.

One night, as he lay restlessly in the dark, he began to wonder how the extreme tension he felt in his body might relate to his insomnia. Perhaps if he could relax his body he might also be able to relax his mind and finally get to sleep. He tried relaxing his body part by part, starting with his arms, and then his legs, stomach, back, and so on, progressing through to his jaws, mouth, and eyes. He found that as long as he was thinking about his muscles he was not thinking about anything else, certainly not his worries! And when he was finally able to get his eyes, mouth, and jaws relaxed, he would stop thinking and drift off.

Relaxing the body's muscles in a systematic way was one of those personal discoveries that are so simple, so intuitive, and so obvious that you have to marvel that nobody had ever written about it before. It's a perfect illustration of subjective personal experience being at the very heart of science. Jacobson spent the next several years scientifically validating his intuitive discovery with controlled measurements of tension under various conditions. He was particularly interested in verifying that his system of methodical relaxation truly succeeded in quieting the autonomic nervous system and diminishing nervous tension. To gain maximum objectivity, Jacobson devised ways to measure the tiny electric currents generated in muscles when they were tense and then again when they were relaxed. His innovations became the foundation for biofeedback and electromyography, which are widely used today in many kinds of treatment and research.

In his book *Progressive Relaxation*, first published in 1929, Jacobson offered the medical world his procedure for systematically relaxing the skeletal muscles. He promoted his method as "scientific relaxation" because he had proven it could not only alleviate anxiety and other psychological problems, but could also help prevent serious medical problems like heart attacks, ulcers, chronic fatigue, irritable colon, and high blood pressure. His physiological measurements had shown that the smooth muscle of the internal organs becomes overly tense along with the skeletal muscles. He intended that this "reeducation" of the neuromuscular system could be prescribed by physicians as an alternative to sedative drugs (Jacobson 1938).

As a physician, Jacobson did prescribe sedative drugs from time to time, although he generally preferred to avoid them. I think he would be disappointed in today's practice of medicine with its overreliance on psychoactive drugs.

Jacobson's system of therapy, as presented in his first book, required a long series of lessons, because he didn't believe that "scientific" relaxation could be learned without professional help. Later, he changed his mind about that and wrote several books designed to introduce progressive relaxation to the layman in a form that could be self-taught. He hoped that progressive relaxation would ultimately be taught to children in the schools.

It's Not Contract/Relax

In the second edition of *Progressive Relaxation* (1938), Jacobson says that as soon as patients have developed a clear awareness of muscle tension, they should no longer contract before relaxing. In *Self-Operations Control*, a little manual for the patient that accompanied *Anxiety and Tension Control* (1964), another book for physicians, Jacobson specifically advised against developing a habit of contracting before relaxing. In *You Must Relax* (1970), his final word was that you should use the rule of “diminishing tensions,” contracting less and less until you don’t need to contract at all. Unfortunately, in all cases this instruction is buried in the text and cast as something just said in passing. In some of his books, Jacobson neglected to mention it at all, leading to the widespread misunderstanding today that contraction is an intrinsic element of the method and is always required. As a consequence, writers of current books on relaxation consistently present Jacobson’s progressive relaxation as “contract/relax,” which is not actually what he intended.

The problem with contract/relax is that you can’t contract a muscle without making the rest of your body contract to some degree at the same time—even the muscles that you’ve already relaxed! This can slow the process of reaching a state of deep relaxation or keep you from attaining it altogether. In my view, most people have an instinct for relaxation and can do it even under stress if it occurs to them to try. As a massage therapist, I frequently find it helpful to have the client consciously relax the muscle I’m working on.

All of this having been said, if you’re occasionally unsure whether you sense tension in a muscle, go on and tighten it slightly to give yourself a point of reference. But it should be just a shadow of tightness and held only briefly. As Dr. Jacobson says, you shouldn’t make a habit of it.

Tension Release Procedures

In the beginning, when you’re first learning active tension release, you should give all your attention to it. No other activity should distract you from the sensations in your muscles and the single task at hand. To attain the deepest state of relaxation, you should plan on sessions of thirty minutes to an hour, alone in some quiet place so you can really get focused. If you want to make the process work well for you, put it on your calendar and make a regular date with yourself. Routine is everything.

Jacobson referred to relaxation as your “built-in tranquilizer” (1970). It works better than a pill and is entirely without side effects. You will tend to fall asleep in the middle of doing active tension release whether you’re sitting or lying down. It’s just a sign that you’re doing well at releasing tension. If you find your mind wandering while doing active tension release, simply keep bringing your attention back to your muscles and pick up where you left off. You may have to do this repeatedly.

If you’re human and not some rarified extraterrestrial being, I’ll guarantee that you have unnecessary tension in your muscles. Many people, however, have very little awareness of this state. You may not believe that you’re particularly tense. You may not be able to detect tightness in some of the specified places. Have faith that your awareness and skill will grow with practice. With each step, just focus on letting the specified place get softer and looser than it already is. You’ll catch on very quickly to what localized tension feels like in all the various places. Experience will be your teacher.

Sixteen-Step Release

Each step of this full procedure can be divided into smaller ones. In step one, for instance, it’s best to do one forearm at a time. You can also relax each forearm in two steps instead of one, doing first the back of the forearm and then the front. You can even go so far as to relax individual muscles. People who have learned their muscles well by doing self-applied trigger point therapy can become quite good at this. You will use your mind’s eye to visualize the part you’re relaxing. Take plenty of time, several minutes at least for each step, savoring the experience.

Change the sequence if you like, but you should relax the eyes last, since they are working as monitors throughout the process. You may feel your eyes slightly cross and go out of focus when you release their tensions.

1. Forearms	9. Lower back
2. Hands	10. Mid- and upper back
3. Upper arms and shoulders	11. Top of shoulders
4. Lower legs	12. Back of neck
5. Feet	13. Scalp and temples
6. Thighs	14. Jaws and front of neck
7. Buttocks and hips	15. Mouth and tongue
8. Abdomen and chest	16. Forehead and eyes

Eight-Step Release

This little procedure should take no more than thirty or forty seconds, but you won't have much luck with it until you're quite skilled with the long version. In each of the eight steps, release the tension as you exhale. You can go through the entire procedure in just eight breaths. If you'd like to take a bit more time, allow yourself a few breaths between the tension release exhalations.

1. Shoulders, arms, and hands	5. Back
2. Legs and feet	6. Back of the neck
3. Buttocks and hips	7. Jaw, temples, and mouth
4. Abdomen and chest	8. Eyes

Four-Step Rapid Release

You will be more successful doing this four-step routine after you've become fully experienced with the previous two procedures. But you can try it at any time. You will be releasing the tension in all your body in one exhalation. This routine takes only fifteen or twenty seconds. You can use it in virtually any situation frequently throughout the day. You can't do it too often.

1. Turn your eyes upward without moving your head.
2. Tune in to your general tension for a few seconds.
3. Inhale deeply as you count slowly to five.
4. On five, lower and close your eyes, exhaling as you do so and letting yourself go limp all over. That's all there is to it.

Take two or three more calm breaths, going even more limp and heavy with each successive exhalation, and then go on with whatever you were doing. Hypnotists use this short routine for quick inductions. It's great for getting your attention calmly back on task.

One-Step Instant Release

In time, you will become so adept at dealing with excess muscle tension that mere awareness of tension will trigger the response to let it go. This is the One-Step Instant Release, the true “relaxation response,” a purely physical response requiring no verbal affirmations, meditation, repeated mantra, or cognition of any kind. I experience this simplest form of tension release dozens of times a day. It’s my secret. Nobody ever knows I’m doing it, but it has become an integral part of who I am. You already possess a degree of this inborn ability to let go of tension at will. Practice at systematic relaxation will hone this natural ability and take you places you never thought you could go.

Passive Tension Flooding

Edmund Jacobson believed that once you’ve learned to detect tension there’s never any need to contract a muscle before relaxing it. It may seem a contradiction now to propose that you should encourage muscle tension by the process of passive tension flooding. I believe Jacobson would’ve liked the idea of tension flooding, but there’s no indication in his writing that it ever occurred to him.

When nervous tension is very high, an attempt to use active tension release can be highly frustrating, actually resulting in increased tension. Muscles sometimes seem to have minds of their own. Trying to force them to relax can be like trying to keep the lid on a pot of boiling water. You’re able to relax to a certain level, but then you reach a tension barrier that you can’t break through. The tension you’ve gotten rid of seems to want to come right back. Keeping the lid on it becomes a continual battle. Many people simply may quit trying.

Passive tension flooding is a procedure to be used when active tension release fails. With passive tension flooding, instead of trying to relax, you stop resisting the tension or trying to suppress it. When you’re in a state of anxiety, it’s actually the excessive muscle tension that creates the extreme sense of discomfort that you’re motivated so strongly to escape. Facing and accepting this discomfort is profoundly therapeutic. If you say to your muscles in effect, “Okay, get it out of your system,” the tension will consume itself very quickly and the sense of anxiety will be diminished to a very marked degree. Muscle tension and nervous tension are so intimately linked that the relief of muscle tension alone can free your mind and facilitate your taking action to resolve whatever issue is generating your anxiety (Wolpe 1958).

Before trying passive tension flooding, you should develop considerable skill with active tension release to hone your awareness of tension and gain some skill in the objective control of it. After you’ve learned passive tension flooding, you will use it before active tension release when coping with stress. With passive tension flooding, you’ll be able to break through the tension barrier that active tension release can’t penetrate. Going on then with active tension release will take you even further into the relaxed state. The procedures complement one another. Together, they work far better than either one alone.

The Flooding Experience

First, simply take a tension inventory. With your mind’s eye, scan all the muscle groups that you normally relax in the sixteen-step tension release procedure. Tune in to the sense of muscle tension everywhere you find it. Don’t be surprised if it’s worse than you thought. It almost always is. Take note of the places where the tension is greatest—the stomach, jaw, and back of the neck being the places where you probably hold your worst tensions.

Don’t try to relax. Allow the tension to be. Give it permission to exist. Don’t fight it. Don’t resist. If the tension wants to dramatically increase like it did in my hypnosis session with Dr. Storrow, let it do so. It may not increase at all, but if it does, let it gain full expression. Think of it as an adventure. Be curious to see how far it will go.

Take special note of your mouth, tongue, face, and eyes, where tension is amplified by thinking and worrying. You will probably notice that you’re breathing very shallowly, tending to hold your breath. As the tension rises

toward a peak, you may feel like you're going to explode, especially the first time you try this. You may begin to wonder how much of this you can take, but stay with it. Experience the tension as fully as you can. Immerse yourself in it.

Your knotted-up muscles may be hurting by this time, but continue monitoring. Keep watching and observing. You may feel now that you want to let the tension go, that you can barely hang on to it, but hang on a little longer. There will come a point at which you simply can't support the tension any longer and it will quite suddenly flood away all in a moment. As the tension goes, you'll let go of the air you've been holding in, your chest collapsing with an enormous sense of relief. But then, as you take in a big refreshing breath of air, the tension will come rushing back, everything tense like before, all in a knot. Don't be afraid or discouraged. This is good.

Don't try to relax yet. Let the tension return. Let it happen. Don't fight it. Much more quickly this time, the tension will rise to a peak. But you'll see that this level of tension isn't as high as before, hardly more than half. Don't seek control over it. Simply keep watching. Soon it will flood away again, just like before, all in a moment. Are you done now? No, here it comes once more. But it's a smaller peak yet. It goes to maximum right away and then rapidly fades, just like before.

Expect three or four more tension peaks, each one less than the one before it. You'll get one last small surge of tension, hardly worth the name. At this point, take control and begin one of the active tension release procedures. You'll immediately see that you've penetrated the barrier, and you'll be surprised at how extraordinarily easy it is to relax now. You've broken the big knot, the big logjam. Active tension release will work much better now than before, and you'll go to a state of deep relaxation that was unattainable before the flooding. The whole process of passive tension flooding typically takes between ten and fifteen minutes in the beginning. After you've gained sufficient skill, the flooding experience can be gone through in less than thirty seconds.

It's very important to understand that passive tension flooding is the direct opposite of the contract/relax method, in that you don't contract muscles intentionally. It might seem that you could compound the effect by tightening your muscles on purpose and giving them a real workout, but it doesn't work that way. Intentional contraction tends to leave more residual tension than if you let the muscles tighten, peak, and release on their own. You may fear that you risk cramping by indulging the tension in muscles. This may be true occasionally for some people, but in thirty-five years I've never had a muscle cramp doing passive flooding. Ironically, even though the experience can feel quite dramatic, the amount of tension the muscles undergo is actually much less than during many ordinary kinds of work or play.

In focusing solely on muscle tension, passive tension flooding gives you an objective handle on nervous tension, leaving emotional issues to take care of themselves as a natural consequence of the lessened tension. Dealing cognitively with emotional issues may or may not be necessary. Passive tension flooding seems to work even without a clear understanding of your emotional responses or their history. The effectiveness of this simple idea is explained by *paradoxical intention*, a therapeutic model introduced by Viktor Frankl, the Viennese psychiatrist famed for surviving the Nazi death camps by making use of this distinctly proactive mindset.

Paradoxical Intention

Dr. Frankl used the term "paradoxical intention" to describe the age-old ethic of gaining victories over your fears by doing the last thing in the world you would ordinarily want to do. The object is to intentionally confront the thing you're afraid of. You not only deliberately expose yourself to your fears; you come to desire that exposure (1984).

Failure to face your fears tends to perpetuate them. Avoidance of the hated object increases your fear of it, because you never give yourself a chance to learn to cope with it. As an example, it's a mistake to use earplugs when irritated by noises. Escaping noise in this way too quickly relieves your anxiety and teaches you that escape is the correct response. Further, it reinforces your conviction that annoying noises should be avoided because you "can't stand them." It becomes more and more true that indeed you really can't stand them. My job in learning to cope

with noises was, paradoxically, to cultivate a desire to hear them and to learn not to fear the muscle tension they provoke.

Fundamentally, any flight from anxiety-provoking situations undermines the habit of coping. The relief granted by escape reinforces the flight response. You never get the chance to strengthen yourself in the face of adversity. To be truly successful in coping, you must not give yourself the option of running away (Frankl 1988).

We supposedly have just two choices when faced with a threat: either fight or flight. But a third response may have fundamentally greater clout, at least in its potential for facilitating change. That third response to threat or fear is neither fighting nor fleeing, but simple acceptance. This is the core of paradoxical intention. It is also the core of passive tension flooding.

Beyond Tension Control

Muscle tension is the common theme in anxiety, anger, phobia, depression, fear, and physical pain. Habitual muscle tension can compound these problems by predisposing you to becoming even tenser and inappropriately emotional at any provocation. Muscle tension then feeds on itself, snowballing, magnifying the sense of anxiety, and perpetuating not just physical pain but emotional pain. According to Edmund Jacobson, your feeling of nervous tension or anxiety consists largely of the physical sensations caused by uncontrollable tension that exists in your muscles and internal organs. In essence, nervous tension may be very little more than this acutely uncomfortable sense of muscle tension (Jacobson 1938).

The interaction between emotional disturbances and muscle tension can constitute a feedback loop of mutual reinforcement and perpetuation. Passive tension flooding and active tension release can be used to break this vicious circle and overcome overly emotional responses to problems. It works that way with me, if I have the presence of mind to use what I know.

Tension flooding appears to be the operative element in psychotherapeutic methods such as systematic desensitization, exposure therapy, aversion therapy, implosion therapy, massed practice, and awareness training. None, however, employs the conscious acceptance of muscle tension exclusively, but are occupied instead, diffusely, with the entire range of subjective feelings. Passive tension flooding is closer in concept to a method proposed by British physician Nicholas Malleon, who held that it is necessary to fully experience not only your fears, but also all the bodily sensations that come with them (Malleon 1959).

Psychiatrist Joseph Wolpe defined flooding as the intentional prolonged exposure to relatively strong anxiety. He believed it was similar to *abreaction*, a phenomenon that has a long history in human affairs. In *abreaction*, you tell about a disturbing memory that is connected to your anxiety or fear. As you describe the event, you experience overpowering emotion and appear to be living through it again. People typically feel great relief after going through an *abreaction* (Wolpe 1958).

Passive tension flooding is similar to *abreaction*, except that, again, it is concerned exclusively with muscle tension. Because of this mechanical, nonpsychological focus, I believe it can be safely used as a general desensitization procedure to self-treat nervous tension, anxiety, anger, and fear. It's the antithesis of control, and yet it makes the ultimate control of negative emotional states far more certain. It should be used first with fantasized events when you're alone and in a safe, quiet place. In a fantasized event, a kind of daydream, you can safely experience your aversions, fears, phobias, anxieties, resentments, and other things that make you defensive or tense.

Repeated practice of this imaginational experience with passive tension flooding can diminish the intensity of your negative responses and reduce habitual muscle tension. Later, you can gradually introduce passive tension flooding into real situations. I've used this technique for decades and continue to use it, totally without negative consequences.

When using passive tension flooding to temper your tension reaction to a particular problem, divide your attention between the fantasized event and your muscle tension. Work with the least troublesome problem first. If it's a noise, for instance, choose the noise that bothers you the least and progress step-by-step over time to more bothersome noises. You grow stronger by degrees when you choose battles that you can win. If you would like to

start the day with good karma, do both passive tension flooding and active tension release first thing in the morning, working with some current problem in an imagined scene. An ability to calmly face the problem in fantasy will improve your response in real situations as you go along through the day.

Expectations

This two-part method of systematic relaxation isn't something that you do a few times and then you're all cured of your nervous tension. Your tension reactions are so much a part of you that it's unreasonable to expect them to ever completely disappear. Stomach tightening in problem situations, for example, can happen so fast that it catches you by surprise, before you even realize what's going on. A lifelong habit of responding to stress with tension in your neck and shoulders can be so insidious that you may be unaware of it most of the time. Sleep is another place where you will inevitably be victimized by old unconscious tension habits.

Even when you're able to make the method work well in a given circumstance, it may take a while to see any overall improvement. If you persist, however, in time you will notice a general decrease in tension and a lowered intensity of reaction to annoyances and perceived threats.

If your motivation is strong enough and if you are capable of applying good information with persistence, I believe systematic relaxation can be learned and implemented without professional help. If your psychological problems are intense, however, or you're leery of the very idea of passive tension flooding, trust your intuition and leave it alone. Or you can find a professional counselor who can help you with it. A professional, in fact, might be very interested in the contents of this chapter. In an exhaustive search of the Internet and the perusal of several dozen books on psychology, I've found no therapy that resembles passive tension flooding in its specific and exclusive focus on muscle tension.

Your success with systematic relaxation will be intimately linked to how much you practice it. It's inevitable that you will fall back into old habitual responses unless you are committed to learning new ones. Systematic relaxation has to become a part of living, something that you do almost without thinking. You will find that, like self-applied trigger point massage, this system is extraordinarily easy once you understand it, develop some skill with it, and integrate it fully into your life.

You shouldn't take any of this to mean that you should aspire to be constantly relaxed. That's not possible and not really desirable either. Tension, even a certain amount of nervous tension in the form of vigorous action, is necessary for a meaningful life. It's only when tension becomes excessive that it makes trouble for you. The main thing here is that if you want to have less physical and emotional pain and fewer and more manageable trigger points, make a commitment to learning to deal with unnecessary habitual muscle tension.

Epilogue to Chapter 12

by Amber Davies

My father wrote this chapter because, as you have read, his experience with active tension release and passive tension flooding were as profound as his experience with trigger point massage. He felt he had discovered a hidden jewel and wanted to share it with the world. He believed that his ideas moved the essential concepts developed by Edmund Jacobson forward another step or two. His deepest hope was that bright psychologists would embrace these innovations, study them in clinical practice, and then write about their work to bring these ideas into the mainstream. In their book *A Headache in the Pelvic: A New Understanding and Treatment for Prostatitis and Chronic Pelvic Pain Syndromes* (2003), Drs. David Wise and Rodney Anderson detail a variation of progressive relaxation they call “paradoxical relaxation.” This method is similar to my father’s idea of passive tension flooding in that the user is directed to focus on tension in the body and to accept its presence. It is a method used specifically in their clinic to deal with chronic pelvic pain. Dr. Wise also has another book, *Paradoxical Relaxation: The Theory and Practice of Dissolving Anxiety by Accepting It* (2010), devoted to this concept. If you find the concept of passive tension flooding useful, you may also find these other two books to be helpful.

Definitions and Terms

Abduction Movement away from the midline of the body. Opposite of adduction.

Abductor Muscle that moves the bone away from the midline of the body.

Acromion The prominent outer point of the shoulder blade. It extends out laterally from the spine of the scapula to join with the collarbone (clavicle).

Active isolated stretching (AIS) Involves actively contracting the opposing muscle (antagonist) to stretch a muscle. Additional passive stretch is applied for only two seconds. Uses the principle of reciprocal inhibition.

Active trigger point A trigger point that causes a clinical pain complaint. It is always tender, prevents full lengthening of the muscle, weakens the muscle, can refer patient-recognized pain upon direct compression (ten to fifteen seconds or more). To be distinguished from a latent trigger point.

Acute Recent onset (hours, days, or a couple of weeks).

Adduction Movement toward the midline of the body. Opposite of abduction.

Adductor A muscle that moves the bone toward the midline of the body.

Adhesion Fibroblast formation caused by tearing, disruption of collagen fibers from trauma, immobilization, or as a result of surgical treatment.

Agonist A muscle that does the same action as another muscle.

Anatomical position Person standing up facing forward with arms straight and palms facing forward. Also called “anatomical neutral.”

Antagonist A muscle that moves in the opposite direction.

Anterior Toward the front of the body. Opposite of posterior.

Anterior superior iliac spine (ASIS) Most prominent bony projection on the front of the pelvis.

Anterior tilt Front of the structure tilted forward. The pelvis is anteriorly tilted when hip tilt exaggerates lumbar lordosis (sway back). It is possible for only one side of the pelvis to be tilted.

Aponeurosis A white fibrous sheet composed of collagen fibers that connects a muscle to bone.

Caudal Near the lower part of the body.

Cervical Relating to the neck, or first seven bones of the spine.

Chronic Condition lasting three to six months or longer.

Chronic myofascial pain syndrome The sensory, motor, and autonomic symptoms caused by multiple myofascial trigger points and fascial constrictions.

Clavicle Commonly called the collarbone. Long, curved bone nearly horizontal to the first rib.

Coccyx Commonly called the tailbone. Last three to five vertebrae of the spine.

Concentric contraction Contraction of muscle that shortens the fibers and brings the muscles' attachments on the bones closer together. Also develops tension as it shortens.

Contraction (of muscle) To pull together, to reduce in size or increase tension by drawing together.

Contract-relax Gentle voluntary muscle contraction followed by relaxation with encouragement of elongation of the muscle.

Contracture (of muscle) Sustained intrinsic activation of the contractile elements of muscle fibers. With contracture, muscle shortening occurs in the absence of motor unit action potentials (or electrical activity).

Contralateral Affecting or located on opposite side of the body.

Coracoid process Thick, curved bony process at upper outer border of scapula. Projects through the body to the front right, beside the humerus (upper armbone).

Cranial Relating to the skull (containing the brain).

Deep Away from the surface. Opposite of superficial.

Dermatome An area of skin supplied by a single spinal nerve.

Distal Away (farther from) from the point of origin, as opposed to proximal. Usually indicating farther down and away from the midline of the body.

Dorsal Relating to the back or posterior body (or upper surface of the foot).

Dorsiflexion Flexion of the foot or toes upward towards the knee.

Eccentric contraction Muscle lengthening under tension occurs when muscle lessens in tension to control the descent of resistance. Muscle contraction while lengthening.

Essential pain zone Primary referred pain pattern (as opposed to spillover pattern, which is less common).

Eversion Turning the bottom of the foot outward or laterally.

Extension Straightening movement resulting in increase of angle in a joint, restoring a body part to its anatomical position after flexion.

External rotation Rotary movement around the longitudinal axis of a bone away from the midline of the body. Also known as lateral rotation or outward rotation. Example: to turn the feet all the way to the outside (like a ballet dancer in first position) the thigh bone has to externally rotate in the hip socket.

Fascia Fibrous membrane covering, supporting, connecting, and separating muscle.

Femur Thighbone; longest and largest bone in the body.

Flexion Movement of bones toward each other at a joint by decreasing its angle, as opposed to extension.

Foramen An opening or natural passage in a bone for vessels and nerves.

Forward-head posture Carrying head positioned forward of line of gravity caused by extension in the upper cervical vertebrae and flexion in the lower cervical vertebrae.

Fossa A shallow depression.

Friction Back and forth or circular movement that moves the adjacent tissue in relation to each other.

Greater trochanter of the femur Broad, flat process at the top of lateral femur (thigh bone).

Humerus Long bone of the upper arm, extending from the shoulder to the elbow.

Iliac crest Superior border of the wing of the ilium (hip) and the superolateral (upper outer) margin of the greater pelvis. The top of the hip bone palpable from the sides and back.

Inferior Located in a lower position in relation to another structure.

Internal rotation Rotary movement around the longitudinal axis of a bone toward the midline of the body. Also known as medial or inward rotation. Example: To put your palm on your belly button, the humerus (upper arm bone) has to internally rotate in the shoulder joint.

Inversion Turning the bottom of the foot inward or medially.

Ipsilateral Located on the same side of the body.

Ischemic compression (static pressure) Pressing a painful spot for a period of time or until a reaction is felt. Replaced by new technique of Travell and Simons called “trigger point pressure release.”

Ischial tuberosity Each side of the inner pelvis, which supports the body’s weight in sitting position, formed by bony prominences of the ischium (hip bone). Also called the sit bone.

Isolated contraction Concentric contraction of muscle for the purpose of locating a specific muscle.

Joint Meeting of two or more bones.

Latent trigger point Myofascial trigger point that is clinically silent in regard to pain. May cause stiffness, shortening of the muscle, and other autonomic phenomena. To be distinguished from an active trigger point.

Lateral Away from the midline of the body, as opposed to medial.

Lateral flexion To bend or tilt to the side. Usually describing the neck tilting so the ear goes closer to the shoulder. Also movement of the trunk away from the midline of anatomical neutral.

Lateral rotation To turn the front of the arm or leg away from the midline of the body, as opposed to medial rotation. Also called external rotation.

Ligament Dense, soft tissue that connects bone to bone; provides stability to joints.

Local twitch response Transient contraction of a small group of tense muscle fibers that are associated with a trigger point. Usually created by compression of or needling of a trigger point. Indicates that a trigger point is present in those muscle fibers.

Lumbar Pertaining to the lowest spine between the ribs and the pelvis. There are five lumbar vertebrae.

Mandible Lower jawbone.

Medial Toward the midline of the body, as opposed to lateral.

Medial rotation To turn the front of the arm or leg in toward the body, as opposed to lateral rotation. Also called internal rotation.

Median Centrally located in the body, nearer to the midline.

Metacarpal Five bones in the palm of the hand between the carpals of the wrist and fingers.

Metatarsal Five bones in the foot between the tarsal bones and the toes.

Midline Invisible line that divides the body into equal left and right sides.

Motor nerve Produces movement, conveys impulses from nerve to muscle.

Myofascial Pertains to skeletal muscle ensheathed by fibrous connective tissue called fascia.

Myofascial trigger point Hyperirritable spot in skeletal muscle associated with hypersensitive palpable nodule in a taut band. It’s painful on compression and can give rise to characteristic referred pain, referred tenderness, and/or motor dysfunction.

Neuromuscular junction Location of interaction between a motor nerve and a muscle.

Neutral position Anatomical position.

Palmer Palm of the hand.

Palpate To touch with the fingers or hands, to examine by touch or feel.

Perpetuating factors Factors that continue a dysfunctional state or pattern. Examples are mechanical stressors, nutritional inadequacies, psychological factors, chronic infection, and nerve impingement.

Plantar Sole or bottom of the foot, as in plantar warts.

Plantar flexion To point the toes downward.

Plexus Network of nerves and vessels (veins) or lymphatics.

Posterior Toward the back of the body, as opposed to anterior.

Primary pain pattern Area of referred pain sponsored by a primary trigger point.

Primary trigger point Myofascial trigger point activated directly by acute or chronic overload, or repetitive overuse of the muscle in which it occurs and was not activated as a result of trigger point activity in another muscle.

Process Marked prominence extending from an anatomic structure, usually for the attachment of muscle and ligaments.

Pronation To turn the hand palm down, as opposed to supination.

Prone Lying facedown, as when on a treatment table.

Proprioceptive Neuromuscular Facilitation (PNF) Combination of passive muscle stretching and resisted muscle contractions. Enhances neurological rehabilitation involving spiral and diagonal movement patterns (stretching is only one part of this system).

Proximal Toward the center of the body, as opposed to distal.

Reciprocal inhibition Neurological principle of the neuromuscular system; when one muscle contracts its opposing (antagonist) muscle relaxes due to decreased neurological activity.

Referred pain Pain that is felt at a site different from the place of origin.

Rotation Movement around a fixed axis, for example, turning the head.

Rotator cuff A musculotendinous structure encircling and giving strength to the shoulder joint. Made up of the infraspinatus, supraspinatus, subscapularis, and teres minor muscles.

Sarcomere Smallest unit of muscle contracture.

Satellite trigger point Myofascial trigger point that was induced neurogenically or mechanically by the activity of a primary trigger point.

Scapula Large, flat triangular bone that forms the back of the shoulder. Commonly called the shoulder blade.

Sensory nerve Axon that conveys information from the muscle to the nerve center.

Spasm Involuntary, sudden contraction of a muscle or group of muscles.

Spillover pain zone The region where a minority of people experience referred pain beyond the essential pain zone due to greater hyperirritability of a trigger point.

Spine of the scapula Palpable, almost horizontal bony structure on the back of the scapula (shoulder blade).

Spinous processes Dorsal projection from the center of a vertebral arch. Sharp projection of the vertebrae palpable and visible through the skin of the neck and back. What most people call the spine.

Sprain Overstretching or partial tearing of a ligament.

Strain Partial tearing of a muscle or tendon.

Stretch To lengthen muscle tissue.

Superficial Toward the surface, as opposed to deep.

Superior Toward the top, as opposed to inferior.

Supination Action of turning the hand palm up, as if you were going to eat soup from your hand.

Supine Lying in face-up position, as when on a treatment table.

Synergist Muscle that does the same action as another.

Taut band Group of tense muscle fibers extending away from a trigger point.

Tendon Soft tissue that connects muscle to bone.

Tendinitis Inflammation of the tendon. Redness, heat, and swelling present at site of pain.

Tendinosis Pain at the tendon attachment or muscle-tendon junction.

Thoracic Torso. There are twelve thoracic vertebra, one for every rib.

Transverse process Bony protrusion that projects on either side of the arch of the vertebrae from the junction where the lamina joins the pedicle; there are two on each vertebra. Palpable on the sides of the neck.

Trigger point (also see myofascial trigger point) Hyperirritable, localized spot of exquisite tenderness in a localized taut band of muscle tissue. This spot is painful on compression and can give rise to characteristic referred pain, referred tenderness, and autonomic phenomena. A place in the muscle that stays contracted all the time as a result of trauma, overuse, emotional tension, or other stimulus. It is painful to the touch and refers pain in predictable patterns.

Tuberosity A relatively large protuberance on a bone.

Vertebra Bone housing the spine. One of the bones of the spinal column.

Resources

Books

Atlas of Human Anatomy by Frank Netter (Lippincott Williams & Wilkins, 1989).

Clinical Application of Neuromuscular Techniques: The Lower Body by Leon Chaitow and Judith Walker DeLany (Churchill Livingstone, 2011).

Clinical Application of Neuromuscular Techniques: The Upper Body by Leon Chaitow and Judith Walker DeLany (Churchill Livingstone, 2008).

Clinical Massage Therapy: A Structural Approach to Pain Management by James Waslaski (Pearson, 2012).

The Frozen Shoulder Workbook: Trigger Point Therapy for Overcoming Pain and Regaining Range of Motion by Clair Davies (New Harbinger Publications, 2006).

Headache in the Pelvis: A New Understanding and Treatment for Prostatitis and Chronic Pelvic Pain Syndromes by David Wise, PhD, and Rodney Anderson, MD (National Center for Pelvic Pain, 2003).

A Massage Therapist's Guide to Pathology (5th edition) by Ruth Werner (Lippincott Williams & Wilkins, 2013).

Migraine Brains and Bodies: A Comprehensive Guide to Solving the Mystery of Your Migraines by C. M. Shifflett (Round Earth Publishing, 2011), www.roundearth.stores.yahoo.net.

The Muscle and Bone Palpation Manual with Trigger Points, Referred Pain Patterns, and Stretching by Joseph E. Muscolino (Mosby, 2009), www.learnmuscles.com.

Muscle Pain: Diagnosis and Treatment edited by Siegfried Mense and Robert D. Gerwin (Springer, 2010).

Muscle Pain: Understanding the Mechanism edited by Siegfried Mense and Robert D. Gerwin (Springer, 2010).

Myofascial Pain and Dysfunction: The Trigger Point Manual, Vol. 1, Upper Body (2nd edition) by David Simons, Janet G. Travell, and Lois S. Simons (Williams & Wilkins, 1999).

Myofascial Pain and Dysfunction: The Trigger Point Manual, Vol. 2, Lower Body by Janet G. Travell and David Simons (Williams & Wilkins, 1992).

Myofascial Trigger Points: Pathophysiology and Evidence-Informed Diagnosis and Management edited by Jan Dommerholt and Peter Huijbrecht (Jones and Bartlett, 2011).

Orthopedic Massage: Theory and Technique by Whitney Lowe (Elsevier Publications, 2009).

Pain Relief with Trigger Point Self-Help by Valerie DeLaune (North Atlantic Books, 2011).

Paradoxical Relaxation: The Theory and Practice of Dissolving Anxiety by Accepting It by David Wise, PhD (National Center for Pelvic Pain, 2010).

Quick Reference Evidence-Based Muscle Manual by Nikita Vizniak (Professional Health Systems, 2011), www.prohealthsys.com.

Trigger Point Therapy for Low Back Pain: A Self-Treatment Workbook by Sharon Sauer and Mary Biancalana (New Harbinger Publications, 2010), www.myopain.com.

DVDs

Anatomy Trains: Myofascial Meridians. “Bodyreading 101.” DVD set. Available from www.anatomytrains.com.

Acland's DVD Atlas of Human Anatomy (2003) and *Video Atlas of Human Anatomy* (1995) by Robert Acland. Available from www.amazon.com.

Ergonomic Aids

Standing/Sitting Ergonomic Workstations (retail)

www.ergotron.com

www.ergodirect.com

Insoles

Morton's Foot Syndrome Insole (wholesale or retail)

www.mortonsfoot.com

Massage Tools

Backnobber (wholesale or retail)

The Pressure Positive Company

128 Oberholtzer Road

Gilbertsville, PA 19525

800-603-5107

www.pressurepositive.com

www.triggerpointproducts.com

Body Back Buddy (wholesale or retail)

www.bodytools.com

High Bounce Balls (bulk orders)

2½-inch (60 mm) and other sizes found here

www.rinovelty.com

High Bounce Balls (small orders)

www.triggerpointproducts.com

www.ssw.com

Large Inflatable Balls

Fitball Body Therapy Ball, 5 inch and 7 inch

www.ballodynamics.com

Knobble (wholesale or retail)

EDCAT Enterprise

733 North Beach Street

Daytona Beach, FL 32114

800-274-3566

The Pressure Positive Company (see Backnobber above)

www.pressurepositive.com

www.triggerpointproducts.com

Shemala Fingers

www.bodytools.com

The Myofree Solution: The Missing Piece in the TMJ Puzzle

www.pressurepositive.com

www.tmjpainolutions.com

The Stick (wholesale or retail)

www.thestick.com

Thera Cane (wholesale or retail)

www.massagewarehouse.com

EDCAT Enterprise (see Knobble above)

Thera Cane (wholesale)

Thera Cane Company

P.O. Box 9220

Denver, CO 80209-0220

www.theracane.com

Tiger Tail (wholesale or retail)

The Pressure Positive Company (see Backnobber above)

Various Tools

Denis Behm Supply, Inc.

800-733-3106

www.dbsupply.net

www.triggerpointproducts.com

Seminars, Therapist Directories, and Research Websites

www.360NMT.com

Neuromuscular and myofascial trigger point therapy continuing education seminars taught by Stew Wild and Katie Adams.

www.aims-llc.org

American Institute for Myofascial Studies website featuring seminars for therapists interested in becoming a certified manual trigger point therapist. Provider list for those looking for a certified therapist.

www.amtamassage.org

American Massage Therapy Association website. Listing of health conditions clinically proven to be treatable with massage therapy. Good resource for current massage therapy research and finding a massage therapist.

www.anatomytrains.com

Fascia system information, research, and seminars for professional therapists. Good site to find an advanced massage or manual therapist.

www.apta.org

American Association of Physical Therapists. To find a specialist in pelvic pain syndromes click on "Public," then "find a PT," then select specialty in women's health.

www.conceptsborn.com/eirg.htm

Drug and disease reference information.

www.dgs.eu.com

David G. Simons Academy in Switzerland. Myofascial pain treatment seminar provider for physicians, physical therapists, and chiropractors in Europe. Good resource for the latest research in myofascial pain and trigger points.

www.imc.edu

Training program in massage therapy with an emphasis on myofascial trigger point therapy. Advanced training for experienced therapists also available. Located in Pittsburgh, PA.

www.learnmuscles.com

Joseph Muscolino's website with excellent anatomy and trigger point books, articles, DVDs, and seminars for massage therapists and chiropractors.

www.myopain.com

Sharon Saurer's website featuring seminars for therapists interested in becoming certified in myofascial trigger point therapy.

www.myopainseminars.com

Seminar provider for physical therapists, massage therapists, physicians, and others. Good site to find current research in myofascial pain.

www.myofascialtherapy.org

National Association of Myofascial Trigger Point Therapists website. Good resource information and find-a-therapist directory. Links to various myofascial pain seminar providers for physical therapists, massage therapists, physicians, and others.

www.nmtcenter.com

Neuromuscular massage therapy taught by Judith DeLany. Good site to find advanced massage therapists or neuromuscular workshops for professionals. Includes a therapist database for finding a trained practitioner.

www.nmtmidwest.com

Neuromuscular massage therapy taught by Doug Nelson. Good site to find neuromuscular massage workshops for professionals. Includes a therapist database for finding a certified neuromuscular therapist. Good site to find current research on the treatment of pain.

www.omeri.com

Orthopedic massage therapy taught by Whitney Lowe. Good site to find advanced massage therapists or orthopedic massage workshops for professionals. Includes a certified practitioners directory.

www.orthomassage.net

Orthopedic massage therapy taught by James Waslaski. Good site to find advanced massage therapists or orthopedic massage workshops for professionals. Includes a find-a-therapist directory.

www.pelvicpainhelp.com

National Center for Pelvic Pain Research run by David Wise, author of *Headache in the Pelvis* and *Paradoxical Relaxation*. Good site for all people suffering from chronic pelvic pain.

www.roundearth.stores.yahoo.net

Round Earth Publishing website by C. M. Shifflett, author of *Migraine Brains and Bodies: A Comprehensive Guide to Solving the Mystery of Your Migraines*. This book and wall charts detailing range of motion tests limited by trigger points are also available on this website.

www.tmjpainsolutions.com

TMJ dysfunction website featuring Gail Falzon's Myofree Solution TMJ and Headache Self-Care Tool and DVD set. Excellent resource for pain sufferers and professionals who treat jaw, face, and head pain.

www.TriggerPointBook.com

Amber Davies's website with treatment information and links to good resources, including massage tools. Class schedule for trigger point workshops for pain sufferers and for massage and manual therapists.

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Clair Davies, NCTMB (nationally certified in therapeutic massage and bodywork), specialized in trigger point massage for the treatment of pain. Mr. Davies's interest in massage began when he successfully self-treated a frozen shoulder with trigger point massage. Inspired by the experience, he began an intensive private study of trigger points and referred pain. He subsequently retired from a thriving piano service business to attend the Utah College of Massage Therapy where he trained as a professional massage therapist. From his home base in Lexington, Kentucky, Mr. Davies traveled extensively with his daughter Amber, leading continuing education workshops for professionals on trigger point massage. Clair Davies died peacefully at home in 2006 of colon cancer.

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Now deceased, foreword writer **David G. Simons, MD**, was coauthor of *Travell & Simons' Myofascial Pain and Dysfunction: The Trigger Point Manual*.

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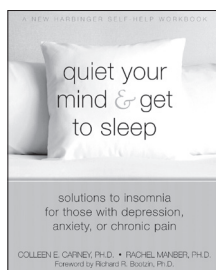
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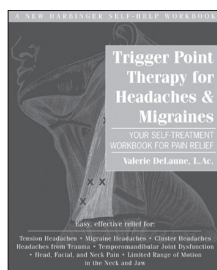
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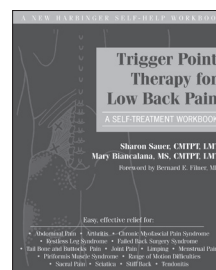
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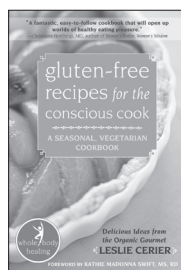
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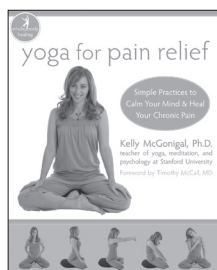
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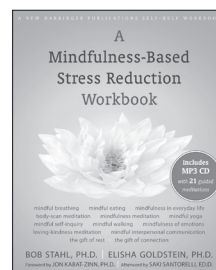
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These 120 muscles can all be found in the regular index, but this one-page index will help you find them quicker. To make the book even more useful, you may want to have a coil binding put on it at a copy center, which will allow it to open flat to any page, leaving both hands free to do therapy.

treat chronic pain yourself—anytime, anywhere

If you suffer from chronic, debilitating pain, surgery and other invasive measures aren't your only options. What many people don't know is that pain is often referred from other areas of the body, sometimes far away from the place where the discomfort is actually felt. Trigger point therapy is often used by physical and massage therapists to relieve this hard-to-treat pain. Now, you can begin using this powerful method on your own to start feeling better right away.

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Now deceased, **Clair Davies, NCTMB** (nationally certified in therapeutic massage and bodywork), gained an interest in massage when he successfully self-treated his own frozen shoulder using medical textbooks on muscle pain. He then went on to develop a complete system for self-treating myofascial trigger points using simple tools.

Amber Davies, CMTPT, LMT, is a certified myofascial trigger point therapist, massage therapy educator, and author. Ms. Davies offers continuing education to professional therapists and teaches self-treatment to people in pain.

Now deceased, foreword writer **David G. Simons, MD**, was coauthor of *Travell & Simons' Myofascial Pain and Dysfunction: The Trigger Point Manual*.